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The Memory Representation of Motor Skills: A Test of Schema Theory.

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The Memory Representation of Motor Skills: A Test of Schema Theory

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Foreword

This dissertation has been written in the style adopted by the American Psychological Association for submission to scholarly journals. Pages 1-56 represent the body of the manuscript as prepared for journal submission. The remaining pages constitute the appendices and contain some background information on the prototype versus exemplar models of memory representation in cognitive psychology, an illustration of the apparatus, schedules of practice and KR withdrawal, tables of the MANOVA, ANOVA, Newman-Keul's pairwise comparisons, and regression results, cell means and standard deviations, experimental instructions and the computer program used to run the experiment.

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Abstract

Currently, the pre-eminent model of central representation for motor skills is embodied in Schmidt's schema theory of discrete motor skill learning (Schmidt, 1975). Two experiments are reported here that contrast predictions from a schema abstraction model that is the basis for schema theory to those from a specific exemplar model of motor skill memory representation. In both exeriments, subjects performed 300 trials per day of 3 variations of a 3-segment timing task over 4 days of acquisition. The subjects then eithered immediately transferred to 4 novel variations of the same task (Experiment 1) that varied in degree of environmental similarity to the exemplars experienced during acquisition, or performed two novel and two previously experienced exemplars following 24-hour and 1-week retention intervals (Experiment 2). The results indicated that novel task transfer was not affected by the contextual relationship between the acquisition and transfer exemplars, and that there was no advantage for a previously experienced exemplar over a novel exemplar after either a 24-hour or 1-week retention interval. These results are interpreted as being indicative of a schema abstraction model of memory representation.

The Memory Representation of Motor Skills:
A Test of Schema Theory

If well-learned motor skills are centrally represented in memory, then an important area of inquiry for research in motor behavior is to investigate the nature of the representation of these skills in memory. If the form or content of the memory representation is determined, then important knowledge will be provided for understanding the process by which the memory representation is developed as well as how this representation interacts with environmental information to produce a motor response. The general approach taken here is to investigate the question of memory representation by assessing performance on novel variations of a well-learned task. This assessment allows a comparison between two models of memory representation: an abstractive, schematic model and an instantiated, exemplar model. A consideration of the relationship between novel exemplars performed during transfer and the exemplars experienced during acquisition should allow for this assessment of the two models to be made.

Currently, the pre-eminent model of central representation in motor skills is embodied in Schmidt's schema theory of discrete motor skill learning (Schmidt, 1975). As originally proposed, schema theory maintains that rather than individual movements being represented in memory a class of movements becomes represented. The representation of the class of movements contains three essential elements, a generalized motor program (GMP) and two schemata. According to Schmidt's view, the GMP is an abstract representation of the invariant features of the movement class and the two schemata, referred to as recall and recognition, are complex rules which allow for the production and evaluation of movements in concert with the GMP (Schmidt, 1975).

Schema theory is actually an adaptation to motor skills of the prototype model of concept and category representation. (For examples of prototype models, see Fried & Holyoak, 1984; Posner & Keele, 1968, 1970; Reed, 1972.) Prototype models typically propose that in establishing a representation of a category in memory, a central tendency of the exemplars experienced during the learning process (the prototype) is formed and stored. Then, over time, the specific exemplars are forgotten. Therefore, when required to retrieve category representations so that a particular task can be performed, such as classifying new exemplars, the prototypes are retrieved. Classification is achieved by comparing the new exemplar to the retrieved prototypes. The new exemplar is then placed in the category to which the prototype it is most similar to belongs.

One difference between prototype models for cognitive memory representation and schema theory for motor skill representation is that prototype models are directed at the recognition and classification of stimulus items while schema theory is directed towards the production of movements. The common link, however, is that both models hypothesize learning as being the product of an abstraction process that results in the formation of a central representation that is not a directly perceived experience but rather, the compilation and synthesis of a number of instantiated experiences. The prototype model's memory representation of a category consists of the central tendency (either mean or mode) of the category, while schema theory proposes a central representation consisting of the invariant features of the class of movements and the relationships among the various sources of information.

A review of the research that has tested schema theory indicates that support for a schema form of representation for motor skills is rather tenuous (see Shapiro & Schmidt, 1982). Of the several predictions that can be drawn from schema theory, the variability hypothesis has been the most popular with researchers. This particular hypothesis holds that the greater the amount of variability of exemplars experienced during practice, the stronger will be the schematic representations. Evidence for the stronger schematic representation can be obtained by noting a subject's ability to perform a response from the appropriate movement class that has not previously been performed (novel task transfer). Two issues can be raised concerning this hypothesis. First, although support for the variability hypothesis has been produced using child subjects, the results have been quite equivocal using adult subjects (Shapiro & Schmidt, 1982). In fact, a recent article has suggested that it may not be the amount of variability that has produced the results found but the schedule under which the variable practice is presented (Lee, Magill, & Weeks, 1985).

Second, the contention that novel task transfer success by necessity must indicate schema formation can be questioned. Schmidt's view of the form of representation was clearly based on the assumption that successful novel task transfer is a direct manifestation of a schema based representation. As he stated, "the most impressive kind of evidence that could be generated in support of the schema is that subjects can produce movements of a given class that they had, strictly speaking, never performed previously" (Schmidt, 1975, p. 245). By proposing a memory representation that consists of an abstract referent image (GMP) that is combined with a complex, abstract rule (recall schema) for movement production, Schmidt achieved a flexible and adaptable model that accounts for novel task transfer. But, given the empirical difficulties that schema theory has faced, the question arises as to whether an alternative model will account for novel task transfer as well as schema theory and yet overcome some of the empirical difficulties that schema theory has encountered.

It is interesting to note that since Schmidt proposed the schema theory in 1975, an alternative to the prototype model has arisen for the representation of concepts and categories. This alternative view, called the exemplar model, has fueled considerable debate and has led many prominent memory scholars to reconsider the question of memory representation of category information (e.g., see Estes, 1986). The exemplar model, in its simplest formulation, maintains that rather than it being necessary to abstract information from a series of exemplar experiences to form a memory representation of the category, each individual exemplar is stored in memory along with a category label. When the need arises for a categorization of a novel exemplar, it is a simple matter of comparing the novel exemplar to those stored in memory and assigning it to the appropriate category (see Brooks, 1978; Jacoby & Brooks, 1984; Medin & Schaffer, 1978).

Consider how an exemplar-based model offers an alternative to schema theory and the use of the GMP and recall schema to produce movement. For motor skills the environmental conditions immediately prior to performance (the affordances, according to action theorists, e.g. von Hofsten, 1985) can be seen as a memory probe to activate the part of long term memory which is most similar to the current conditions (Hintzman, 1986; Medin & Schaffer, 1978). This activated subset of long-term memory becomes working memory (Baddeley, 1978) and contains the memory traces for all responses previously performed under similar environmental conditions. The memory trace contains, in addition to the environmental cues, the action plan used for that particular performance and some information regarding the success of the response. A search of working memory will produce the memory trace for a response that was performed successfully under the most similar previous conditions. Then, the action plan will be borrowed from the memory trace and utilized for the production of the current response. Therefore, a novel task can be successfully performed by using the parameters that were utilized to perform the response successfully under the most similar, previously experienced conditions, thus negating the need to construct a new action plan. The success of the current response depends most strongly on the match between the current and previous environmental conditions. In this model, the ability to produce a novel response, therefore, does not depend on items such as the variability of experienced exemplars or the schedule of variability. Rather, it depends on the degree of environmental similarity between the novel task and the previously experienced exemplars.

The exemplar model offers an attractive alternative to schema theory for three reasons. First, it too allows for novel task transfer but offers a better means of accounting for the degree of error that is introduced into novel response performance, since the typical result is that a novel response is never performed as well as a previously practiced response on immediate transfer. Second, the exemplar model promotes a more active role for the environment in producing responses, a view that has been promoted recently (e.g., Lee, 1980). Finally, the exemplar model is computationally more efficient than schema theory. There is no need for an abstraction mechanism eliciting relevent information following a performance or for an abstract representation constructing a new action plan prior to each performance. On the other hand, the shortcomings of the exemplar model are the need for more storage space, although this does not seem to be a critical problem since most theories of memory consider long-term memory to have an unlimited capacity, and a greater reliance on retrieval mechanisms than does schema theory.

Contrasts between schema theory and an exemplar-based model can be achieved experimentally in a number of ways. The most fruitful approach is to consider novel task performance, since this is the point of convergence of the two models. Two divergent predictions can be made. First, schema theory predicts that all novel responses which fall within the same movement class should be performed equally as well once the GMP and recall schema are well established. The abstracted rule (recall schema) should be able to produce the exact parameters that are needed by the abstracted motor program (GMP) to accomplish the desired outcome, although some error in translating the parameters into overt movements will be noticed. An exemplar model, on the other hand, would predict a differential amount of error in performing novel responses. The amount of performance error should be a function of the distance between the novel response and the most similar, previously experienced movement. Thus, the greater the environmental similarity between the novel exemplar and a previously experienced exemplar then the less will be the amount of error in performance. Second, schema theory implicitly predicts that, once an exemplar has been passed through the abstracting mechanism for the formation of the GMP and schemata, it is discarded. Therefore, following a sufficient retention interval that allows for the abstracting and forgetting processes, there should be no difference between the performance of a previously experienced exemplar and the performance of a novel exemplar. On the other hand, an exemplar model would predict a performance advantage for the previously experienced exemplar, since an action plan containing the specific parameter values would be available in memory, whereas the novel response would have to be performed using parameters approximated from the nearest stored exemplar.

Therefore, the purpose of this study was to provide an empirical test of these two predictions from schema theory concerning novel task transfer and to compare their outcomes with what would be predicted from an exemplar-based model of motor skill memory representation. The only previous research that has investigated this question using motor skills was done by Solso and his colleagues (Solso, Amant, Kuraishy, & Mearns, 1986; Solso & Raynis, 1979). In these studies, the authors kinesthetically presented their subjects two sets of geometric patterns formed from base prototypes. Following an acquisition phase, subjects were presented a second series of patterns and asked to identify the patterns as previously experienced (old) or not previously experienced (new) and to rate their degree of confidence in their judgement. The results generally indicated that subjects were quite good at identifying old and new exemplars except in the case of the prototypes which were usually classified as old despite never being experienced during acquisition. The protoypes often received a higher confidence rating as being old than the previously experienced exemplars. These results were interpreted as being indicative of a schema abstraction process for memory formation. However, the difficulty from a motor behavior perspective is that the movement patterns were passively experienced by the subjects. The question of the form of memory representation still remains for motor skills that need to be actively produced by the performer.

Athough an exemplar-based model has not been explicitly expounded for motor skill memory representation, it must be pointed out that the model being proposed here bears some similarity to the stimulus generalization work done by Dickinson and his colleagues (Dickinson & Hedges, 1986; Hedges, Dickinson, & Modigliani, 1983). The stimulus generalization model hypothesizes that a stimulus gradient is established for a particular response and that if a specific stimulus falls within that gradient, then the associated response would be produced. A connection between the stimulus generalization model and the exemplar model is that environmental similarity is seen as being a critical element in an individual's ability to produce a response. The stimulus generalization approach does not, however, provide any hypotheses concerning the form that the representation of a response class may take in memory. In fact, an exemplar model, if veridical, could quite easily accommodate the data produced from the work on stimulus generalization.

Although the main issue being investigated here concerns the memory formation of schemata, interwoven within this concept is the parallel notion of the formation of the GMP. It can be assumed that the GMP is the product of the same abstraction process that produces the schemata. Given this, schema theory hypothesizes that one critical information source that is abstracted would be the relative time pattern for the movement class. Relative time, by necessity, would be an invariant feature of movement performance and should be constant across all response variations of the movement class. An exemplar model, since it does not have an abstraction of any sources of information occurring, would not necessarily exhibit invariant relative timing, although an individual could theoretically impose a timing structure on performance. As a corollary to the main investigation, then, an analysis of the relative time structure of the movement patterns appears appropriate, especially if the data support a schema abstraction process.

Experiment 1

This first experiment tested the predictions of the schema abstraction and specific exemplar models with regards to the performance of novel responses. According to the schema view, if it can be reasonably assured that a GMP and recall schema have been established for the class of movements, then each of the responses should be performed equally well.[1] The relationship between the novel responses and those experienced during acquisition should not influence performance of the novel responses. An exemplar model, however, predicts that the relationship between previously experienced and novel responses should influence novel response performance. That is, novel responses that are required to be performed in a context that is more similar to the environment in which the responses were experienced during acquisition should be performed with less error than novel responses with contextual charactistics that are less similar to the acquisition environmental charactistics.

To investigate this prediction, subjects practiced several exemplars from a movement class and then performed a number of novel responses that varied in their similarity of environmental characteristics to the exemplars experienced during acquisition. To allow for a measure of similarity among the exemplars, all environmental charactistics were held constant except one: distance over which the movement must be made. The responses involved making controlled timing responses, with error in timing used as the dependent measure.

Method

Subjects. Six, right-handed male volunteers from the general student population at Louisiana State University were used as subjects. Each subject was paid $3.00 per testing session with a $20.00 bonus going to the subject who performed with the least amount of error during the acquisition trials.

Apparatus and task. The task was a 3-segment timing movement (see Figure 1 for a diagram of the task). Subjects were required to complete all exemplars of the movement class in the overall duration of 1200 msecs. Thus, exemplars were distinguished only by the distance moved. All exemplars had the same ratio of movement distance between segments (2:3:1). Given the similar topological characteristics, it was assumed that all exemplars belong to the same movement class.

Insert Figure 1 about here

During acquisition, three exemplars were practiced: a short movement (5 cm-7.5 cm-2.5 cm), a medium movement (15 cm-22.5 cm-7.5 cm) and a long movement (45 cm-67.5 cm-22.5 cm). Following acquisition, all subjects transferred to four novel movement distances, two "near" exemplars that were a factor of .5 from the closest acquisition exemplar (7.5 cm-11.25 cm-3.75 cm and 37.5 cm-56.25 cm-18.75 cm) and two "far" exemplars that were a factor of 1.0 from the closest acquisition exemplar (10 cm-15 cm-5 cm and 30 cm-45 cm-15 cm). Similarity of environmental characteristics, then, is defined as the relative distance a novel exemplar is from an acquisition exemplar, which is distinct from the absolute distance over which any one exemplar is performed.

The apparatus consisted of two, 82 cm by 61 cm response panels, with one used for performing the acquisition exemplars and the other used for performing the transfer exemplars. On each of the response panels, a common start switch was located 44 cm from the left side and 3 cm above the lower edge. The exemplars were designated by placing response switches at the end points of each segment of the movements. The response switches were 1 cm by 1.5 cm momentary push-button switches. The subjects were required to contact each switch in sequence for a particular exemplar on every trial. The switches that corresponded to a particular exemplar were color coded. Thus, on the acquisition response panel, the three switches for the short exemplar were blue, for the medium exemplar were white, and for the long exemplar were red. On the transfer response panel, the three switches for the shortest "near" exemplar were green, for the longest "near" exemplar were yellow, for the shortest "far" exemplar were grey, and for the longest "far" exemplar were orange.

Also on each reponse panel was a centrally located display of LEDs, three on the acquisition panel and four on the transfer panel. A small colored square under each of the LEDs corresponded to the color code for a specific exemplar. The illumination of a particular LED indicated to the subjects which exemplar was to be attempted on the next trial. The top edge of each panel was elevated so that the panel sloped towards the subjects at a 20^{o} angle. The response panels were interfaced with an Apple IIe microcomputer, which controlled the sequences of presentation of the exemplars and provided for data collection.

Procedures. The experiment consisted of two phases, acquisition and transfer, and took place over five, 1-hour testing sessions on each of 5 consecutive days. The acquisition phase occured on the first 4 days and the initial part of the 5th day. Subjects performed each acquisition exemplar 100 trials per day for the first 4 days and then 20 trials of each acquisition exemplar on the 5th day. The transfer phase occurred on the 5th day. During transfer, subjects peformed 10 trials of each transfer exemplar. The transfer phase was separated from the acquisition phase on day 5 by a 5 minute interval during which the subjects were seated quietly outside of the testing room and the acquisition panel was replaced by the transfer panel.

In order to decrease variability of performance during acquisition, a 1200 msec tone was used as a training aid. This tone was used in several different ways and resulted in each trial being done under one of four conditions. These conditions were _imagery_, where the subjects listened to the 1200 msec tone and imaged the movement that they were required to make; _movement-with-tone_, where the subjects performed the appropriate movement in concert with the 1200 msec tone; _tone-then-movement_, where the subjects listened to the 1200 msec tone and then attempted the movement; and finally _movement-only_, where no tone occurred and the subjects simply attempted the specific movement on their own. Imagery trials, however, were not used in determining the number of trials performed each day. Therefore, subjects performed 300 overt movement trials per day in addition to the imagery trials. The practice conditions were arranged so that on each day the subjects progressed from imaging the movements, to making movements aided by the tone, to finally performing the movements with no external cue. The number of trials allotted to each practice condition was manipulated so that, as the days progressed, the subjects performed fewer tone-aided trials and more movement-only trials. All transfer trials were performed in the movement-only condition.

During the acquisition phase, the three exemplars were presented to the subjects in either a blocked or random fashion. The blocked or random organization of the exemplars was manipulated so that, for the first 3 days, a subject's initial experience with the exemplars under a particular condition of practice would be blocked and the later experience within that same condition random. The presentation of blocked and random trials within each condition of practice was also manipulated so that a greater number of random trials were being performed each day. Following day 3, except for imagery, all trials were presented in a random order.[2] (See Appendix B for the actual schedule of trial presentation during acquisition.) All transfer trials were randomly presented.

KR, constant error (CE) for the total movement time (TMT), was presented to the subjects during the acquisition phase of the experiment. No KR was presented during transfer, however. To attempt to overcome the decrements in performance that are often noted when transferring from a KR to no-KR condition, KR was slowly withdrawn during the acquisition trials so that by the end of the acquisition phase, the subjects only received KR on every 10th trial. (See Appendix C for the schedule of KR withdrawal.)

For imagery trials, the LED for the appropriate exemplar was illuminated on each trial. Subjects were then given several seconds to orient themselves to the required response. Then, a 200 msec warning tone sounded, followed by a constant delay interval of 750 msec and then by the 1200 msec tone. The subjects were instructed to image the actual movement they would make in concert with the tone. For the movement-with-tone trials, the procedures were identical to the imagery trials through the end of the warning tone. The subjects were then instructed to begin moving at their discretion following the warning tone. The 1200 msec tone began at the same instant the subject left the start button. For the tone-then-movement trials, the procedures were identical to the imagery condition. The subjects were instructed to begin their movement as soon after the end of the 1200 msec tone as they liked. On the movement-only trials, the LED indicating a specific exemplar was illuminated initially, and the subjects were given a few moments to orient to the required response, as was done for the previous conditions. The 200 msec warning tone then sounded and the subjects were instructed to begin moving at their discretion after the warning tone. Presentation of a trial during the transfer phase was identical to the movement-only condition of practice during acquisition.

Subjects were required to perform within acceptable error ranges on each day. Subjects unable to perform within these ranges were eliminated from the experiment. The ranges of acceptable error, based on the collection of pilot data, were $\pm$ 120 msec for day 1, $\pm$ 90 msec for day 2, $\pm$60 msec for day 3, and $\pm$ 45 msec for day 4. To determine if a subject had performed within these ranges, the last 40 trials each day were blocked into groups of 10 and then the mean absolute error for the three best blocks was calculated. If this score was within the acceptable range the subject was permitted to continue in the experiment.

Results and Discussion

The effect of acceptable error ranges on the experiment was negligible, as only one subject failed to meet the established criteria. This subject was replaced so that analysis was performed on the complete data for six subjects. Because of the complexity of the experimental design, a single model of analysis was not possible. Rather, two smaller models were formed, one aimed at investigating performance during the acquisition phase and the second at analyzing transfer performance. Separate analyses were run on two sets of dependent variables, error scores and relative time measures. Interpretation of all analyses for significant differences was done at $p \leq .05$.

Error scores during acquisition. A randomized block design was used for analysis with 50-trial blocks formed for the first 4 days and the first 60 trials of day 5 being formed into a single block. This resulted in 25 blocks for the acquisition phase. Two error scores were analyzed, absolute error (AE) and variable error (VE). Performance during acquisition for each of these error measures can be seen in Figure 2. A 6 (subject) x 25 (block) x 3 (exemplar) MANOVA with repeated measures on the last two factors was used for analysis.

Insert Figure 2 about here

There was a significant main effect for blocks, $F(48,238)=5.33$, $p=.0001$, and exemplar, $F(4,498)=2.33$, $p=.05$, but a non-significant block by exemplar interaction, $F(96,496)=.83$, $p=.87$. (All F approximations for MANOVAs were done using the Hotelling-Lawley Trace procedure.) Subsequent follow-up ANOVAs showed that the significant block effect was noted for both AE,

$\underline{F}(24,120)=9.10$, $\underline{p}=.0001$, and VE, $\underline{F}(24,120)=8.11$, $\underline{p}=.0001$. Post-hoc Newman-Keuls pairwise analyses of the blocks for both AE and VE revealed that performance during block one was significantly worse than any other block and that by day 2 of acquisition, no further significant differences were found. Thus, most of the performance improvement occurs on day 1 (over the first six blocks) with only slight improvement beyond this point. It seems safe to conclude that the subjects' performance reached asymptote by day 4 of acquisition.

ANOVA follow-ups of the exemplar main effect revealed that significant differences were found for AE, $\underline{F}(2,250)=3.72$, $\underline{p}=.03$, but not VE, $\underline{F}(2.250)=.93$, $\underline{p}=.39$. Post-hoc Newman-Keuls' pairwise comparisons on AE indicated that the shortest of the three exemplars, the blue movement, was performed with more error overall than the longer red or white exemplars. Analysis of exemplar performance within each block demonstrated that all of this difference occurred during the first four acquisition blocks. By the end of acquisition, there was no difference in performance among the three exemplars.

Insert Table 1 about here

Table 1 presents the means and standard deviations of the error scores for both AE and VE by exemplar during block 25 of acquisition and during the tranfer phase of the experiment. It can be noted from this table that there was an actual difference of only 8.7 msec for AE and 7.0 msec for VE from the best to worst performed exemplars during block 25 of acquisition. It can also be noted that performance on the exemplars does not line up along an absolute distance dimension as the shorter white exemplar has the highest levels of error, rather than the longer red exemplar.[3]

These analyses indicate that each of the three exemplars were being performed similarly at the end of the acquisition phase. Overall, subjects demonstrated considerable improvement in performance from the beginning to the end of acquisition and reached low, relatively stable levels of performance on all three exemplars.

Error scores during transfer. The main goal of the data analysis here was to determine if there were differences among the four novel exemplars and, if any differences did occur, would these differences line up along a "near-far" dimension. A secondary goal was to determine if transfer performance differed from performance at the end of the acquisition phase. To accomplish these goals, the 10 transfer trials for each exemplar were formed into a single block, resulting in four blocks of transfer performance (one for each exemplar), and mean AE and VE calculated for each block (see Table 1). These four blocks were combined with the last block of acquisition (block 25) in a single model of analysis. A 6 (subject) x 5 (block) MANOVA with repeated measures on the second factor and preplanned single degree-of-freedom contrasts were used to anaylze the data. The preplanned contrasts were used to compare the two transfer blocks for the "near" exemplars to the two tranfer blocks for the "far" exemplars and block 25 of acquisition to the four transfer blocks.

The results of the preplanned single degree-of-freedom contrasts indicated that there were no differences in performance of the "near" and "far" transfer exemplars. In fact, as can be derived from the data in Table 1, there was a difference of only 1.4 msec between the means for the two "near" and the two "far" exemplars on AE. Since none of the transfer exemplars' performances differed from each other, these results are clearly supportive of the schema view of memory representation. The relationship of the transfer exemplars to the acquisition exemplars was not an influencing factor for transfer performance.

The results of the MANOVA analysis revealed that the main effect for block was significant, $\underline{F}(8,62)=3.23$, p=.004. Follow-up ANOVAs revealed that this result was due to a difference in AE, $F(4,32)=4.13$, $p=.008$, but not VE, $F(4,32)=1.67$, $p=.18$. The results of the preplanned single degree-of-freedom contrasts indicated that the significant AE main effect for blocks was due to a difference between block 25 of acquisition and the transfer performance. The elevated levels of AE are a fairly typical finding from studies of novel task transfer and as such, were not unexpected. Subjects were, however, able to maintain their level of performance consistency. The decrement in AE but not in VE represents an interesting phenomenon of the data and will be considered in more detail during the general discussion.

Since a schema abstraction model is quite strongly supported by the data, an interesting supplementary question that can be asked is whether evidence for an abstraction of the GMP, and more specifically, the invariant feature of relative timing, can also be found. To answer this question, a subsequent analysis of the relative time patterns of the responses was conducted.

Relative time. The relative time for each segment of each exemplar was calculated by dividing the actual duration for a particular segment by TMT. Although the question of what constitutes invariant relative timing is controversial (see Heuer, 1987), the procedures suggested by Gentner (1985) were used here. This analysis involves regressing the relative time data on TMT for each individual. If relative timing is invariant, then this should be evidenced by a slope of the regression line equal to zero. Conversely, variant relative timing should be evidenced by slopes not equal to zero. The data for days 4 and 5 were used for this analysis. The results showed that 4 of 6 subjects for the first segment, 1 of 6 subjects for the second segment, and 2 of 6 subjects for the third segment had slopes that did not differ from zero at the .05 level of confidence. However, of the 11 regressions that did have a slope different from zero, the largest slope was .039. None of the slopes was larger than the standard deviation for that individual subject's performance. This suggests that Gentner's test of relative timing may be too conservative, given the very small magnitudes of the significant slopes. As a result, it would be difficult to conclude that the slopes do not show invariant relative timing.

As a more traditional analysis of the relative time measures, the same model that was used to analyze the error scores was also applied to relative time data. Results of this analysis revealed a significant main effect for exemplar, $F(4,496)=78.67$, $p=.0001$, but a non-significant main effect for block, $F(48,236)=.78$, $p=.84$, and for the block by exemplar interaction, $F(96,496)=.45$, $p=1.00$. Univariate analyses of the individual relative time measures for each segment indicated that the rhythmic pattern for the red exemplar was different than that used for the blue or white exemplar. However, an inspection of the performance of each exemplar within the blocks indicated that most of the differences were found early in practice and that, by the end of acquisition, there were no differences in the relative time patterns of any of the exemplars.

The conclusion that the subjects were using a different relative time pattern during the intial stages of learning the red exemplar as compared to the blue or white exemplars is supported by verbal reports given by the subjects following the completion of the experiment. They indicated that initially they were grouping the blue and white patterns into one movement class and the red pattern into a seperate movement class. However, later in acquisition (usually on day 2), the subjects reported that they experienced more success in performance if they used the same rhythmic pattern for all three exemplars.

The results of these analyses on the relative time data indicate that the exemplars used can be considered to have been derived from the same movement class. It is apparent that during performance of novel exemplars subjects made use of the relative timing, or rhythmic, structure developed during practice. What cannot be concluded from these data, however, is if this relative timing structure consitutes a <u>mandatory</u> ingredient of the the memory representation, or a <u>strategic</u> process used by the subjects (see Heuer & Schmidt, 1988). This is an important point which will be considered more extensively in the general discussion.

It can be concluded from this experiment that immediate novel task transfer provides evidence for a schema abstraction view of memory representation for motor skills. What remains to be answered however, is whether retention performance, i.e., delayed novel task transfer, will provide similar results. It is towards this question that Experiment 2 was directed.

Experiment 2

Following a retention interval, when forgetting of exemplars experienced during practice is allowed to take place, the schema abstraction model of memory representation predicts that there should be no advantage to performing a previously experienced exemplar over performing a novel exemplar. Although this prediction has not been tested empirically for motor skills, it has been considered for concept and category learning. For example, Posner and Keele (1970) had subjects return 1 week following a category learning session. They found that after the 1-week retention interval a prototype, although never experienced during the original learning session, was correctly categorized at a rate superior to the actual exemplars that were experienced during learning. In other words, the subjects appeared to have formed a prototype during the acquisition session and the memory for the prototype was less subject to forgetting than were the actual exemplars experienced. However, Brooks, Jacoby, and Whittlesea (as cited in Jacoby & Brooks, 1984) reported an advantage for remembering exemplars experienced during practice over both the prototype and novel exemplars following a 24-hour retention interval. In fact, for this experiment, novel exemplars that were similar to the previously experienced exemplars were classified better following the retention interval than was the prototype. The obvious difference between these two experiments is the length of the retention interval used, something that has not been empirically investigated. Therefore, the purpose of the present experiment was to contrast predictions from schema abstraction and specific exemplar models of memory representation on the advantage or disadvantage of performing previously experienced exemplars compared to novel exemplars after both a 24-hour and 1-week retention interval. A schema abstraction model predicts no advantage for performing a previously experienced exemplar over a novel exemplar. A specific exemplar model, on the other hand, does predict an advantage for performing a previously experienced exemplar over a novel exemplar.

Methods

Subjects. Six right-handed, male volunteers from the general student population at Louisiana State University were used as subjects. Subjects were paid for their participation at the rate of $3.00 per session with a bonus of $20.00 to the most accurate performer overall.

Apparatus and task. The apparatus and tasks used in this experiment were essentially the same used in Experiment 1. The acquisition panel consisted of the same three exemplars used in Experiment 1. Similarly, four exemplar patterns were located on each of the two retention panels. The 24-hour retention panel had the "red" and "white" patterns from the acquisition panel and the "green" and "orange" patterns from the Experiment 1 transfer panel. The 1-week retention panel had the "blue" and "white" patterns from the acquisition panel and the "grey" and "yellow" patterns from the Experiment 1 transfer panel. Thus, each of the retention panels contained two "new" and two "old" patterns.

Procedures. Identical procedures to those of the first 4 days of Experiment 1, including the schedule of KR withdrawal and ranges of acceptable error, were used in the acquisition session for this experiment. Day 5 was the 24-hour retention test where the subjects performed

48 trials consisting of 12 trials of each exemplar presented randomly. A restriction on randomization was that each of the four exemplars were presented twice in the first eight trials. Day 6 was the 1-week retention test. Subjects returned 1 week following the day 5 retention test. As on day 5, 48 trials were performed, with each of the four exemplars presented 12 times in a random order.

Results and Discussion

Only one subject failed to meet the required acceptable error ranges for each day of acquisition and was replaced. Analysis procedures indentical to Experiment 1 were used, including the use of separate models of analysis for the acquisition and retention phases of the experiment. The dependent variables were again error scores (AE and VE) and relative time measures.

Error scores during acquisition. Acquisition phase trials were formed into 50-trial blocks, resulting in 6 blocks per day and 24 blocks in total. Mean AE and VE data across blocks were calculated and were plotted in Figure 3. A 6 (subject) x 24 (blocks) x 3 (exemplars) MANOVA with repeated measures on the last two factors was performed. The results showed significant main effects for blocks, $F(46,226)=9.24$, $p=.0001$, and exemplar, $F(4,474)=3.44$, $p=.009$, but a non-significant block by exemplar interaction, $F(92,474)=.98$, $p=.54$. Univariate follow-up analyses of the significant main effects indicated that the difference in performance over blocks was evident for both AE, $F(23,115)=14.48$, $p=.0001$, and VE, $F(23,115)=17.44$, $p=.0001$. Post-hoc Newman-Keuls pairwise comparisons indicated that most of the difference in performance across blocks occurred during the first day of acquisition. As noted in Figure 3, there was a rapid improvement in performance early in acquisition, but that performance eventually appeared to have stabilized and reached asymptote by the end of the acquisition phase.

Insert Figure 3 about here

Univariate follow-up analysis of the significant exemplar effect showed that this effect was due to a difference in VE, $F(2,239)=3.78$, $p=.02$, but not AE, $F(2,239)=1.57$, $p=.21$. The significant exemplar differences for VE were due to the red exemplar being performed with less variability than the blue or white exemplars. As with Experiment 1, however, most of this difference occurred during the initial stages of acquisition and by the end of this phase, there was no difference in performance among the exemplars for either AE or VE. As can be seen in Table 2, the actual difference in AE from the best to worst performed exemplar was only 3.0 msec and for VE was only 0.9 msec during block 24 of acquisition.

Insert Table 2 about here

The results of the analysis of the acquisition data indicate that, as in the first experiment, the subjects appeared to have learned the task quite well, having reached a relatively consistent level of performance by the end of the acquisition phase, and that they were performing each of the three exemplars equally well.

Error scores during retention. Before conducting analyses on the retention data, the first eight trials on each day were eliminated from consideration since they were considered to be warm-up trials. This resulted in 40 trials (10 trials of each exemplar) used in analysis of each retention phase. The 10 trials of each exemplar performed within a retention phase were formed into a single block, resulting in 8 blocks for retention (4 blocks per retention phase x 2 retention phases). Means and standard deviations for AE and means for VE were then calculated and can be seen in Table 2. Analysis was then done on the 8 blocks of retention and block 24 of practice. A 6 (subjects) by 9 (blocks) MANOVA with repeated measures on the second factor and preplanned single degree-of-freedom contrasts were then computed. The preplanned contrasts were established to compare performance on block 24 of acquisition to the 4 blocks of 24-hour retention, block 24 of acquisition to the 4 blocks of 1-week retention, the 2 blocks of "old" exemplars to the 2 blocks of "new" exemplars at 24-hour retention, and a similar comparison at 1-week retention.

Results revealed a significant block effect, $F(16,100)=6.93$, $p=.0001$. Follow-up univariate analyses of the data indicated that this effect was for both AE, $F(8,52)=11.77$, $p=.0001$, and VE, $F(8,52)=2.67$, $p=.02$. However, as can be noted in Table 2, there is a general pattern towards a deterioration in performance from the end of acquisition to the 24-hour to the 1-week retention test on both AE and VE, although there is a much greater deterioration in AE than in VE.

The critical comparisons for the retention tests are between the previously experienced exemplars (the "old" ones) and the novel exemplars (the "new" ones). The preplanned comparisons revealed that there were no significant differences between the old and new exemplars for either the 24-hour or the 1-week retention tests for either AE or VE. In terms of the actual data, there was a difference of only 7.5 msecs for AE and 2.6 msec for VE, when averaged across retention interval with the old exemplars being performed with slightly less overall error but somewhat more inconsistenly than the new exemplars.

The results are strongly supportive of the predictions from a schema abstraction model of memory representation. As in Experiment 1, a corollary investigation of the relative time patterns for each of the exemplars within and across the various phases of the experiment was done using the same techniques as described in the first experiment.

Relative time. The regression of the relative time data on TMT revealed that 9 of the 18 possible regressions (three segments across six subjects) had slopes that did not differ significantly from zero. Of the nine slopes that were significantlly different from zero, the largest of these was .015, a value that was smaller than the actual standard deviations noted for each individual. As was concluded in Experiment 1, this test of invariant relative timing appears to be too conservative, and it would be quite difficult to argue against invariant relative timing given this analysis.

To further investigate the relative time patterns obtained during this experiment, the same models that were used to analyse the error data were run on the relative time data. The result of the analysis on the acquisition data revealed a significant main effect for exemplar, $F(4,476)=32.72$, $p=.0001$, but a non-significant main effect for block, $\underline{F}(46,226)=.42$, $\underline{p}=.99$, and for the block by exemplar interaction, $\underline{F}(92,476)=.76$, $\underline{p}=.95$. The univariate follow-up tests indicated that this significant exemplar effect was found in the performance on the second and third segments of the movements, and that the red exemplar was performed with a rhythmic pattern different from the blue and white exemplars. However, an inspection of the relative time patterns for each exemplar within each block indicates that most of this difference occurred early in acquisition. By the last block of acquisition, all three exemplars were performed with the same timing pattern.

The analysis of the retention data revealed a non-significant main effect for block, $\underline{F}(16,100)=.49$, $\underline{p}=.95$. All of the preplanned comparisons performed on the relative time data were non-significant at the $\underline{p}=.05$ level. As can be noted from the actual data contained in Table 3, the striking feature of these data are the remarkable consistency of the relative timing patterns across exemplars and days.

Insert Table 3 about here

When taken together, these results indicate that, although there was a deterioration in performance across the retention intervals, the relative time patterns of the exemplars remained constant from the end of acquisition through the 1-week retention interval. Also, no differences in performance could be found among any of the exemplars following the initial stages of practice. A subject's performance of a particular pattern during retention was not enhanced by previous experience with that specific exemplar, as no differences could be found between performance of the new and old movement patterns at either retention interval. As such, these results are strongly supportive of the predictions from a schema abstraction view of memory representation for motor skills.

General Discussion

In the two experiments reported here, the form of the representation of a motor skill in memory was investigated by considering performance on both immediate novel task transfer and over 24-hour and 1-week retention intervals. The purpose was to distinguish between schema abstraction and specific exemplar models of human memory representation for motor skills. Results indicated that transfer performance on novel variations of the practiced tasks was unaffected by the contextual relationship between the exemplars performed during acquisition and those performed during transfer. That is, when compared to the acquisition exemplars, transfer exemplars that were closer to the acquisition exemplars in terms of relative distance were not performed with any less error than were transfer exemplars that were farther from the acquisition exemplars. Also, performance on both the 24-hour and 1-week retention tests did not demonstrate any advantage for having previously experienced a particular exemplar over performing a completely novel variation of the movement task.

These findings provide strong support for predictions from a schema abstraction view of memory representation. More specifically for motor skills, support is provided for the model of memory representation contained in Schmidt's (1975) schema theory. As predicted by schema theory, subjects were unaffected by the contextual relationship between acquisition and transfer exemplars, and that the specific exemplars experienced during acquisition were not retained in long term memory. It seems equally apparent that an essential ingredient of the memory representation of the particular motor skill being learned in this study was the relative time relationship among the three segments of the task.

The complete lack of support for a specific exemplar model is in striking contrast to results reported by researchers studying cognitive skills where support for the exemplar view is quite strong (Brooks, 1978; Brooks & Jacoby, 1984). In fact, pure prototypic models, on which schema theory is based, have been found to be untenable for cognitive skills. The more recent models have involved composite models that propose both schema abstraction and specific exemplar representations being stored in memory (e.g., Fried and Holyoak, 1984). Evidence either for or against a specific model can often be obtained by manipulations of the experimental conditions, such as manipulating the number of exemplars experienced during acquisition. Normally, practice on only a few acquisition exemplars results in support of an exemplar model while larger number of acquisition exemplars results in support for a schema abstraction model. In the present study, however, the use of only a few acquisition exemplars produced results supporting a schema abstraction model.

A noteworthy feature of the present results reported in these experiments is that they represent a potential lack of congruency between models developed in cognitive and motor skills. It may be that because the production of motor responses needs an interactive memory structure the data arguing against a schema abstraction model in cognitive learning is not applicable to motor skills. That is, the role that is assigned to the memory structure of motor skills is quite different to that of cognitive learning. There is a need with motor skills to have a memory structure that is capable of directing a complex organization of neural information that results in overt movement that is not a requirement in cognitive learning. Because of this, it may be possible that memory models for cognitive learning are not always applicable to memory models for motor skills. If we conclude that a pure schema abstraction model is tenable for motor behaviour, then the empirical difficulties that schema theory have encountered must lie at a level beyond the form of representation in memory.

A possible alternative notion is that the results are task dependent. Since a feature common to all the movements required in this study was maintaining the same relative distance (2:3:1 ratio), the various exemplars experienced could be considered as being on a continuum and lack in distinctive boundaries. That is, the exemplars have few features that make each one clearly distinguishable from the other. It is possible that for a specific exemplar memory representation to be formed, more distinctiveness is required between exemplars. More distinctiveness would allow for a clearer identification of a single exemplar as a separate entity and enhance the opportunity for storage of the exemplar as a unitary item in memory.

A second feature of the responses performed was that the actual movements were quite simple. For simple movements, abstraction of information to form a memory representation may require less of a cognitive effort than storing each exemplar experienced. As the movements become more complex, as is typical for most skills, the increased amount of information that needs to be abstracted may result in the abstraction process being more cognitively demanding than the storage of individual exemplars. Because of this, the storage of information in a specific exemplar form may become more desirable.

It can be pointed out however that despite these possible alternatives, the present results follow closely those reported by Solso and his colleagues (Solso, Ament, Kuraishy, & Mearns, 1986; Solso & Raynis, 1979), who provided evidence for schema abstraction in passively experienced movement situations. The present study extends their findings to include the more real-world situation of actively produced responses. Given this level of support for schema abstraction, it becomes interesting to consider the application of the abstractive process to the formation of the GMP and the inclusion of invariant relative timing as an integral part of the representation.

As has been noted, invariant relative timing seems to be a feature of the memory representation formed by the subjects in these two experiments. However, several results can be observed that provide an interesting insight into the role that the relative time structure plays in movement production. First, for novel transfer or retention, the performance decrements were always greater for AE than for VE. This could indicate that the subjects retained in memory the need for movement consistency across exemplars for successful performance rather than specific movement information. Second, the actual relative time patterns produced were not those that were inherent in the task. Thus, it can be argued that the relative time patterns were subjectively imposed on the task. And third, verbal reports obtained from the subjects following the completion of the experiment indicated that all of the subjects adopted a strategy of applying a constant tempo to each of the exemplar patterns. Taken together, these results suggest that, rather than being an invariant characteristic abstracted from the task, relative time is a strategic ploy that is utilized by the learner to help solve the movement problem. In fact, it may be that, given the simple nature of the movements, the subjects in this experiment represented in memory the strategy for performing (i.e., the rhythm) rather than the actual movements. To perform the response, the subject would retrieve their knowlege of the rhythmic strategy and allow the system to organize the response on-line.

The proposition that the relative time pattern is used as a strategic tool by the subjects supports recent work by Heuer and Schmidt (1988). In this study, subjects reproduced harmonic or non-harmonic position-time curves by means of an elbow flexion and extension movement. Results indicated that transfer was not affected even when the relative time pattern was changed. The conclusion was that invariant relative timing across exemplars of a motor skill most likely represents a stategic phenomenon as opposed to a mandatory characteristic of the GMP.

The results of this study suggest a number of avenues for future research. Since the present study represents a unique approach to investigating memory representation for motor skills, one such possible avenue that is important would be to consider to what degree these results are task dependent. The movements used were somewhat different from previous investigations of schema theory in that the duration of performance was held constant whereas the distance over which the performance must occur was altered. The subject is required to manipulate the speed at which the limb is propelled through space, but is able to maintain the same tempo of performance. This particular task, then, requires the recall schema to provide parameters for overall force, but not for overall duration. Previous works investigating schema theory have tended to hold distance constant while manipulating duration. The subject here would be required to manipulate both speed of limb and tempo of performance. Theoretically, then, these types of tasks require the recall schema to provide parameters for both overall force and duration. It may be that a rhythmic strategy may not be as successful for performance when the need is to parametize both force and duration than when parameters for force alone are required. It would seem to be a worthwhile endevour to replicate this particular study using a task which has a constant distance but a variable duration factor. Along a similar vein, issue can be raised with the complexity of the movement being attempted. It may be that a more specific exemplar memory representation is formed when a task becomes more complex or when the contextual boundaries between exemplars becomes more distinct. Therefore, the need exists to extend this work to a more complex class of movements, one that contains more distinct contextual boundaries.

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Footnotes

[1]"Equally well" may or may not be synonomous with non-significant differences. According to schema, it may be possible for significant differences between novel exemplars to occur. However, if so, then these differences should best be described by a linear function.

[2]It appears possible to produce data supporting either a schema abstraction or exemplar model by a manipulation of the procedures. It is hoped that the procedures used here will not influence subject performance apart from aiding them in learning the task. The use of few exemplars and blocked trials during acquisition may lead to support for exemplar models. The use of the tone and random trials would appear to be conducive to a schema abstraction model. Since elements that lead to both models are present in the procedures, it is assummed that a bias towards either model is not present in the study.

[3]There was some concern that absolute distance moved may have a confouunding effect on error with longer distances naturally resulting in more error in performance. If so, it may have been necessary to standardize the error scores for distance moved. However, this analysis seems to indicate that, for this specific task, distance is not a confounding factor on error.

Table 1

AE Means and Standard Deviations and VE Means (in msec) for each Exemplar at the end of Acquisition and for Transfer for Experiment 1

	Exemplar						
	Acquisition			Transfer			
	(Block 25)			Near		Far	
	Blue	White	Red	Green	Yellow	Grey	Orange
AE							
M	45.02	53.75	49.02	62.08	92.52	64.32	87.47
SD	44.20	37.76	40.32	55.67	57.70	60.33	61.61
VE							
M	49.68	56.71	56.19	73.43	67.84	72.65	70.65

Table 2

AE Means and Standard Deviations and VE Means (in msec) for each Exemplar at the End of Acquisition and Across Retention Test for Experiment 2

Phase	Exemplar	AE		VE
		M	SD	M
Acquisition	Blue	36.7	25.7	40.6
(Block 24)	White	37.7	27.1	39.7
	Red	34.7	25.7	39.8
Retention	White	65.0	46.4	59.2
(24-Hour)	Red	78.8	56.1	46.9
	Green	85.8	71.4	52.8
	Orange	77.9	60.2	57.6
Retention	Blue	130.3	87.9	62.4
(1-Week)	White	163.7	87.5	66.3
	Grey	131.4	65.0	61.9
	Yellow	159.4	74.1	60.9

Table 3

Means and Standard Deviations for Relative Time Data of each Movement Segment for Block 24 of Acquisition and Both Retention Tests (RelT1=Relative Time for Segment 1, RelT2=Relative Time for Segment 2, RelT3=Relative Time for Segment 3)

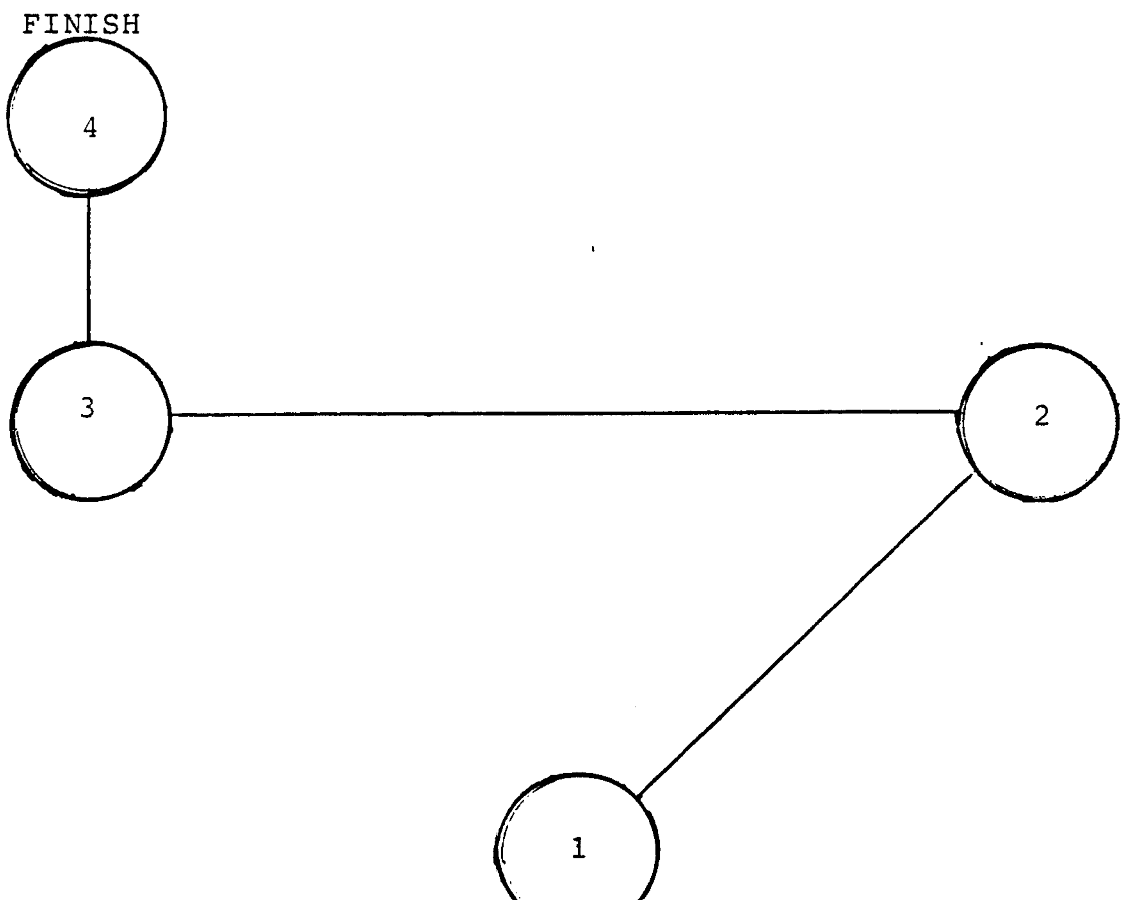
Phase	Exemplar	Relt1		RelT2		RelT3	
		M	SD	M	SD	M	SD
Acquisition							
(Block 24)	Blue	.32	.13	.39	.11	.29	.09
	White	.33	.07	.38	.08	.29	.07
	Red	.33	.07	.40	.06	.27	.07
24-Hr Retention							
Old	White	.33	.07	.38	.07	.29	.07
	Red	.33	.05	.39	.05	.28	.07
New	Green	.32	.08	.39	.08	.29	.08
	Orange	.33	.07	.38	.07	.29	.07
1-Wk Retention							
Old	Blue	.31	.08	.40	.08	.29	.08
	White	.33	.06	.39	.06	.28	.06
New	Grey	.32	.06	.40	.06	.28	.07
	Yellow	.33	.05	.39	.05	.28	.06

Figure Caption

Figure 1. A schematic diagram of the task. Each circle represents the relative location of the momentary push-button switches that defined the end-points of each segment in the task.

Figure 2. Absolute error and variable error (in msec) for acquisition performance collapsed across exemplar (in blocks of 50 trials) for Experiment 1.

Figure 3. Absolute error and variable error (in msec) across acquisition performance (in blocks of 50 trials) collapsed across exemplar for Experiment 2.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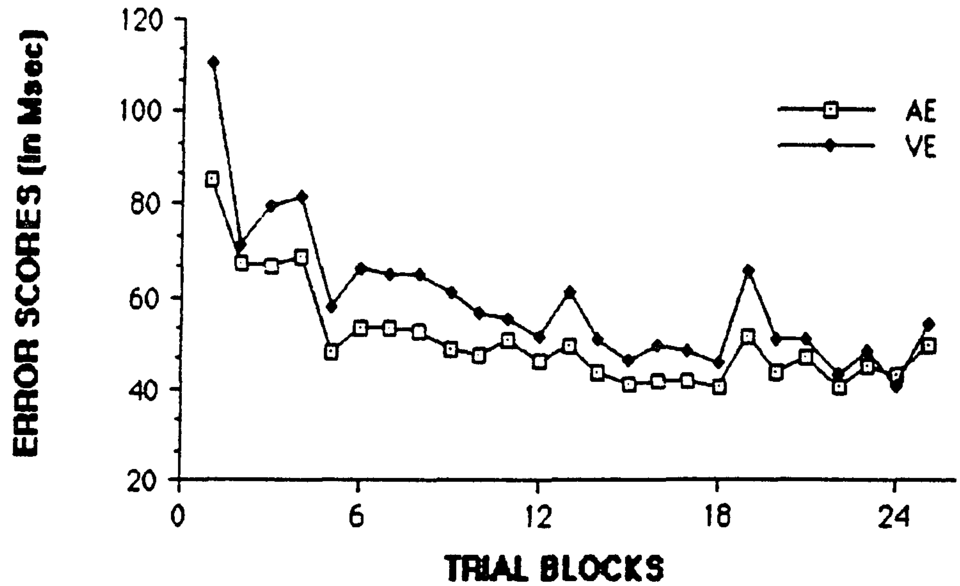
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100
80
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40
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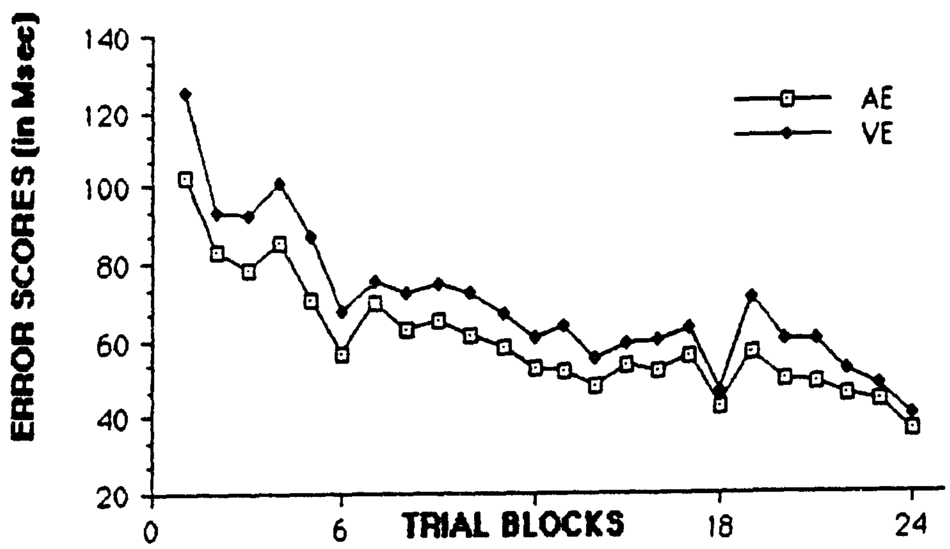
0
6
12
18
24
ERROR SCORES (In Msec)
TRIAL BLOCKS
AE
VE


ERROR SCORES (in Msec)
140
120
100
80
60
40
20
0
6
TRIAL BLOCKS
18
24
AE
VE

Appendices

Appendix A

Prototype Versus Exemplar Models of Memory Representation in Cognitive Psychology: An Application to Motor Behaviour

Prototype Versus Exemplar Models of Memory Representation in Cognitive Psychology: An Application to Motor Behaviour

In a recent paper, Brooks (in press), commenting on the early struggles between cognitive psychology and behaviorism, stated rather disparagingly that in arriving at a pre-eminent position, cognition "...has developed undue faith in the role of centralized, abstracted models as representation of everyday human knowlege." It seems that motor behavior has also been guilty of this leap of faith. In fact, our guilt may be greater than that of cognitive psychology in that a vigorous and healthy debate on the issue of the representation in memory of knowlege has occurred, and is still occurring, in cognition whereas the issue of memorial representation of motor skills does not seem to be undergoing the same rigorous scientific scrutiny in motor behaviour. Among the proponents of central representation in motor behaviour, the assumption appears to be that our memory of a motor skill is stored as abstract knowlege gained from a number of specific experiences with the particular motor skill.

A good example of this abstraction assumption can be seen in Schmidt's (1975) schema theory. In this theory it is hypothesized that the form a representation of a motor skill takes in memory is abstract knowlege of a class of movements consisting of a generalized motor program (GMP) that contains certain invariants needed for performance and two rules (or schemata) that allow for the production and evaluation of a movement at a given point in time. This knowlege is gained by the abstraction of relevant information from more temporary memorial representations of several specific experiences with the movement class.

The line of evidence that Schmidt used to arrive at this view of motor skills being represented in memory as centralized, abstract concepts was borrowed from cognitive science, beginning with Bartlett's (1932) formulation of the notion of schema and continuing through Posner and Keele's (1968, 1970) work on prototype formations in category learning. Despite the warnings from Schmidt, and others, that concepts from cognitive psychology do not always transfer well into motor behaviour constructs, the assumption that motor skills are represented in a centralized, abstract form seems to have been accepted with very little questioning (although see Reed, 1982, 1988, for an opposing point of view on representation). In fact, much of the empirical work that has emenated from schema theory has accepted the GMP and schemata as constants and have investigated predictions based on this assumption (e.g., work on the notion of relative timing, such as Gentner, 1985, or on the variability hypothesis, see Shapiro and Schmidt, 1982, for a review). What is conspicuously absent is an investigation of the assummed form of representation that motor skills take in memory. If the concept of the abstraction of information to form memorial representations is found lacking, then much of the empirical difficulties that schema theory has faced may be better understood.

An investigation into the memorial representation of motor skills would seem to be an important undertaking for motor behaviour. If the exact nature of this representation can be determined, then better understanding of the process by which we learn this representation should be gained and the process by which the represenation interacts with the environment to produce movement should also be better understood. Therefore, research into this problem would have implications for both the learning and control of motor skills. The importance of this question seems to be well understood in the cognitive science field in that the question of representation seems to be one of the major areas of empirical study currently being undertaken. The purpose of this review of literature is to consider the problem of memorial representation of category information as currently being studied in cognitive psychology and then attempt to draw parallels between this research and motor behaviour, hopefully providing a direction that this investigation can take with motor skills. The first section of this review will look at the prototype and exemplar models of representation in cognitive psychology and provide a description of some of the empirical work that supports each model. The second section of the review will attempt to cast this information into a motor behaviour light and provide a possible approach to an empirical investigation of the topic of memory representation of motor skills.

Memorial Representation of Categories

One area of investigation in cognitive psychology that has been of interest to researchers for many years has been that of the acquisition of knowlege about concepts and categories. It is normally assumed that we acquire this knowlege through our everyday experiences with specific members (exemplars) of these categories and concepts. Recently, investigations have concentrated primarily on the memorial representation of the category or concept that is acquired and on how this memorial representation enables one to classify novel exemplars correctly into a concept or category.

Models of Representation

An interesting feature of the literature is the number of models that have sprung up to provide an explanation for the way in which concepts and categories are represented in memory and how this representation allows us to recognize and classify novel exemplars. One study (Hayes-Roth & Hayes-Roth, 1977) compared 26 models accounting for classification data and 12 models aimed at recognition data. Estes (1986a) remarked that the models proliferated as he wrote his article. However, despite this proliferation, it is possible to identify three basic groupings of models- prototype, exemplar and feature frequency models. The first two models (prototype and exemplar) are the most strongly supported, offer the most polarized views, and seem to translate best to the motor behaviour world. For these reasons, they will be the two models that will be taken into consideration in this paper.

Prototype Model. The earliest proposed model for memory representation was the prototype model. The basic idea is that a central tendency (the prototype) is abstracted from our experiences with a number of exemplars from a specific category. The notion of central tendency is similar to that used in statistics; it is normally considered to be the arithmetic mean of the exemplars, although the mode and best exemplar have also been used to define the prototype. Specific exemplars are held in memory only long enough for the abstraction of the information relevant to the formation of the prototype. The prototype consists of the essential features that distinguish the category from other similar categories. When confronted with the need to classify a novel exemplar, an individual will compute the relative distances to the appropriate prototypes and will classify the exemplar into the category according to which prototype it is closest. The essential elements of the "pure" prototype model, then, are that the prototype is formed during acquisition, regardless of whether it is experienced or not; the specific exemplars experienced during acquisition are not retained, only used for their relevant information and then forgotten; and that categorization requires comparison of novel exemplars to a single representation of a category (the prototype).

In essence, the belief in prototypic abstraction of information has been in existence since the time of Socrates and Aristotle. In our more recent time, Posner and Keele (1968, 1970) are usually given credit for the popularization of the model. Generally, the empirical support for the abstraction view comes from the demonstration that, following an acquisition session in which subjects learn to correctly classify exemplars (but not the prototype) into categories, the prototypes from which the categories were developed are recognized more often and classified with less error than exemplars from the same categories that were not experienced during acquisition. Posner and Keele (1968, exp. 3) had subjects classifying randomized dot patterns. Prototypes were formed by randomly placing 9 dots in a 30 x 30 matrix and exemplars were constructed from the prototypes by systematically distorting each of the dots. During acquisition, subjects learned to correctly classify a list of 12 exemplars that were 4 distortions from each of 3 different prototypes. The transfer session consisted of these subjects classifying a list of 24 exemplars which were composed of the 3 prototypes, 6 of the patterns presented during acquisition (2 from each prototype), 6 new patterns formed from the prototypes at a medium level of distortion, 6 new patterns formed from the prototypes at a high level of distortion, and 3 randomly formed patterns not from any of the prototypes. The subjects classified the list of exemplars six times, twice immediately following acquisition and four more times 24 hours later, without receiving any feedback. Posner and Keele found that subjects would classify the prototype with less error and more quickly than any other new pattern from the same class of patterns. Initially, the old patterns were classified better than the prototype, but this advantage would dissappear after one presentation of the transfer items. From this, they concluded that information about the prototype was being abstracted from the exemplars and that this abstraction was probably of the common features of the patterns from a particular category.

To test the relative retention of the various exemplars and prototypes used during acquisition and transfer test, Posner and Keele (1970) added a one week retention interval. Again using randomized dot patterns, they replicated their previous results and found evidence that the old patterns had a higher rate of forgetting than did the prototypes. Apart from providing more evidence for a prototype abstraction view, they concluded these results demonstrated that the abstraction process occurred during acquisition, not retention.

In an interesting variation of Posner and Keele's work, Franks and Bransford (1971) presented subjects with exemplars consisting of a spatial configuration of forms. Prototypes were developed and instances of the pattern were constructed by applying finite transformation rules to the prototypes. Subjects were presented a subset of these instances that varied in transformation distance from the prototype during an acquisition session. Following this, a recognition session was conducted in which subjects were presented another subset of instances and were asked to indicate if they had seen the particular exemplar during acquisition and to rate their degree of confidence in their answer. The data showed that the prototype, in ever case, received the highest rating of having been previously experienced, with the degree of confidence in their answer decreasing as transformational distance increased. They concluded that these results indicated that the memory representation being acquired during the acquisition session consisted of a schema that was composed of the prototype and transformation rules.

Using more realistic stimulus materials, Reed (1972) had subjects classifying brunswik faces into categories. Brunswik faces are schematic drawings of a face that have four features (height of forehead, width of eyes, length of nose and height of mouth) which can take on one of three values. In this study, Reed's subjects would study 10 faces which were 5 exemplars formed from each of 2 prototypes. Rather than being the arithmetic mean, the prototype represented the mode. For example, if the prototypic face had a long nose, then the majority of the 5 exemplar faces studied from this category would also have long noses. Following the acquisition phase where the subjects would learn to correctly classify the 10 faces into their respective categories, the subjects would be given a list of 24 novel faces, including the prototypes, and asked to classify each one. The analysis of results consisted of fitting the data to the predictions from a number of competing models. In addition, verbal reports were also obtained from the subjects. From the data collected, Reed concluded that the "predominant strategy was to form an abstract image or prototype to represent each category and to classify test patterns on the basis of their similarity to the two prototypes" (Reed, 1972, p. 401). He also went on to suggest that subjects would place the greatest emphasis on the features which seemed to best discriminate the two categories.

In a comprehensive study done by Rosch, Simpson and Miller (1976), several different stimulus types were used, including dot patterns, stick figures and consonant/digit strings. From their data, these authors concluded that all of these stimulus types displayed "prototypicality". After the usual acquisition phase, subjects were asked to rate the typicality of novel exemplars, produce as many instances of a category as possible and to classify novel exemplars into categories. Their results demonstrated that the prototypic exemplars were rated as being most typical, reproduced most frequently and classified most quickly. In a further experimental manipulation, Rosch, et al. (1976), provided subjects which more extensive training on "atypical" exemplars, those furthest from the prototype. However, atypical new exemplars were still classified more slowly than typical exemplars.

More recent empirical evidence supporting a prototype abstraction process in category learning has been provided by Fried and Holyoak (1984). In this study, the authors used a visual grid pattern as the stimulus which consisted of a random pattern of light and dark squares within a 10 x 10 matrix. Prototypic patterns were formed and, using computer technology, distortions of these patterns were produced at specific probabilities from the prototypes. Although their experiments were farther reaching than being reported here, the data collected suggested that subjects were forming prototypes for the categories (either central tendency or best exemplar) and that the prototypic representations were retained better than any other exemplar.

In a follow-up study, Flannagan, Fried and Holyoak (1986) presented subjects exemplar patterns during acquisition that were drawn from a multimodal distribution. In classifying patterns during learning, the subjects responded as if dealing with a unimodal distribution; that is, exemplars from a mid-point between the peaks of the multimodal distribution were incorrectly classified as being members of the category. This indicated to the authors that subjects treat categories as being unimodally distributed and are forming a prototype that is the central tendency of the category. Using this prototype to classify novel exemplars would result in errors in classification since a central tendency prototype would be, in this case, incorrect. In the Flannagan, et al., study, this pattern of results can be observed early in learning but, since the learning process continued and feedback about classification was provided, the subjects were eventually able to learn the correct form of the category distribution.

Up to this point, all the studies cited have dealt with the presentation of stimulus items in a visual modality. These studies indicate that, for visually perceived stimuli, an abstraction process to form a prototype seems to occur. However, an interesting question, especially for motor behaviour, would be whether this effect is modality specific or can similar results be obtained with kinesthetically perceived stimuli. This particular question has been addressed in several studies (Lee, 1985; Solso, Amant, Kuraishy, & Mearns, 1986; Solso & Raynis, 1979). Despite having different intents, all used similar methodology. Two sets of geometric patterns formed from base prototypes were kinesthetically presented to subjects. Following an acquisition phase, subjects were presented a second series of patterns and asked to identify the patterns as previously experienced (old) or not previously experienced (new) and to rate their degree of confidence in their judgement. The results generally indicated that subjects were quite good at identifying old and new exemplars except in the case of the prototypes, which were usually classified as old despite never being experienced during acquisition and that the prototypes often received a higher confidence rating as being old than the previously experienced exemplars. These results replicate the findings of Franks and Bransford (1971), as cited earlier in this paper for the visual mode of stimulus presentation. Solso and Raynis (1979) concluded that these data indicated human memory stores representations derived from a wide class of perceived objects that generally embody the frequently repeated themes of the observer's experience and that prototype formation is not restricted to visual experience (p. 711).

Exemplar Model. Most researchers in cognitive science do not dispute the existence of a prototype abstraction mechanism. However, some data exist which lead to questions concerning the role of prototypes as the pre-eminent mechanism for category judgement. The result has been the proposal of a second class of models which maintains that specific exemplars are stored in memory and that classification of a novel exemplar is based on the calculation of distance of the novel exemplar to a stored exemplar. The novel exemplar is placed into the category of which the most similar stored exemplar is a member.

From both a conceptual and computational view, the exemplar based approach is much simpler than is the prototype model since a direct link between exemplars previously experienced and the recognition and classification of novel exemplars is provided without the need to impose an intermediary abstraction process. The drawback is, however, the need for greater storage capacity and a more effecient retrieval mechanism. Some of the strongest support for the exemplar model has come from the work done by Brooks and Jacoby (Brooks, in press; Brooks, 1978; Jacoby & Brooks, 1984).

In the 1984 article, Jacoby and Brooks report a series of three experiements performed in their laboratories. In the first experiment (to be reported in Brooks, Jacoby, & Whittlesea), subjects were presented exemplars from four categories of objects (glasses, cups, bottles, and other glass things). Using a typical prototype paradigm, they found that during retention, new exemplars that were more similar to the training exemplars than the prototypes were classified more quickly than the prototypes and that this advantage persisted over a 24 hour retention interval. These results are, of course, quite different from those obtained in the studies cited in the previous section of this paper. The difference may be due to the stimulus materials used. Jacoby, et al., made use of highly familiar objects (e.g., cups) while studies supporting the prototype model made use of more unique items (e.g., dot patterns). Dealing with objects that are highly familiar to the subject and for which a well established prototypic representation may already exists might result in a more instantiated classification process or the use of a prototype by the subjects that is quite different from the experimentally assummed prototype. In the second experiment (Vokey & Brooks, in press), artificial grammar strings, constructed so that exemplar similarity was maintained for non-grammatical strings, were presented to the subjects. In a later classification of "grammaticallity", verbal reports indicated that subjects usually classified the test strings according to similarity to practice strings. In the third experiment (Whittlesea, 1983), pseudowords that were constructed from two prototypes were used. Exemplars varied by either 1, 2, 3 or 4 letters from the prototype. If subjects were trained on pseudowords from the third ring (3 letter variations), pseudowords that varied by one letter from the exemplars (second and fourth rings) were classified better than were the prototypes.

Medin and Schaffer (1978) used geometric figures and brunswik faces to provide evidence for their context theory, a variant of the basic exemplar model. This theory maintains that the context within which a novel exemplar is embedded acts as a probe to activate the memory representation for similar, previously experienced exemplars. Classification is based on a comparison of the specific exemplars within the activated memory subset to the novel exemplar. Using best-fitting statistical techniques based on mathematically derived predictions from probability equations, they concluded that the context theory provided the best fit for the data, even compared to prototype models.

Estes (1986b) had subjects observe 320 graphs consisting of 8 data points that were based on two prototypes. The graphs were presented to the subjects as being a pictoral representation of a medical patient's 8 symptoms and the subjects' task was to diagnose the patient as having one of two possible diseases. The 320 graphs were arranged so that half of the graphs were representative of one disease (prototype A) and the other half were representative of the second disease (prototype B). Graphs were presented to the subjects in a random order and the subjects were divided into two groups with one group viewing graphs that were labelled with a trigram (representing the "patient's" initials) and the second group viewing unlabelled graphs. Both groups were able to learn the task quite well; however, when analyzed in terms of discriminability of graphs at lags of 0 (immediate repetition of graph) to 10 (10 other graphs interjected between repetitions of the same graph), the labelled group performed much better, indicating that specific exemplar information (the labels) was being used for classification. There was no difference between groups for lags greater than 10. This would seem to indicate that exemplar information was used if the classification task fell within the span of short term memory. For classification of graphs that would require information being retrieved from long term memory, the specific exemplar information (the labels) was not helpful.

Comparison of Prototype and Exemplar Models. Up to this point, the prototype versus exemplar debate has been presented as a dichotomous one and the empirical evidence cited has supported either one position or the other. However, this clear distinction between the models has not always been reflected in the literature. Many researchers have produced data which give evidence for the existence of both types of representations in memory and have resulted in a number of "mixed" models being proposed (e.g. Medin, Altom, & Murphy, 1984; Fried & Holyoak, 1984). Several results from the data can be interpreted as indicative of the operation of both types of representation. First, as reported in Posner and Keele (1970), classification of the prototype is more stable over time than is that of old exemplars. However, classification of old exemplars is superior to that of new exemplar over time as well. If prototype abstraction was the only form of representation then once the old exemplars have been used for their relevent information, they should be forgotten. If this was to occur, then old exemplars should not have an advantage over new exemplars after a sufficient retention interval. Second, increasing the variation of the acquisition phase, either by increasing the variation within the exemplar patterns (e.g., Posner & Keele, 1968; Fried & Holyoak, 1984) or by increasing the training set size (e.g., Homa, Sterling, & Trepel, 1981), results in better transfer to new exemplar patterns. However, this experimental manipulation also results in greater errors in assigning patterns to categories, especially random patterns (Homa, et al., 1981). These results can be considered a contradiction; that is, on the one hand, increasing variation improves the category representation and yet, on the other hand, more errors in assignment are being made, which would seem to indicate a weak category representation.

In considering the evidence collected from the studies cited in this review, particularly that which is cited in the previous paragraph, it becomes obvious that a strict prototype model of representation is untenable. It is interesting to note that even Posner and Keele, who are usually regarded as the main proponents of the prototype model, include the influence of exemplar information in classification tasks. In their work, Fried and Holyoak (1984) promote the category density model which basically considers the representation of a category to have both a measure of central tendency (the prototype) and the variance (specific exemplars). An interesting question that can be asked then, is if a pure prototypic model is untenable, is a pure exemplar model untenable as well?

Hintzman (1986) has postulated a multiple-trace memory model that has a pure exemplar based representation system but is also able to account for the prototype abstraction results of the literature. In this model, each experience results in a separate memory trace in secondary memory. Knowlege of an abstract concept (e.g., categories) is derived from the pool of memory traces at the time of retrieval. As in the Medin and Schaffer (1978) context theory, a novel exemplar would act like a memory probe, resulting in the activation of all traces in the memory pool, with the traces that are the most similar to the probe being more highly activated than the less similar traces. The result of this activation is an "echo" reflected back to primary memory that contains two sources of information, intensity and content. The intensity of the echo reflects the total amount of activation occurring and is assumed to be used for such things as recognition and frequency judgments. The content information in the echo will reflect the common properties of the activated memory traces, including, it must be assumed, category membership. The similarity of this particular model to Adam's closed-loop theory of motor control, particularly the notion of perceptual traces in memory, is striking.

To provide support for his model, Hintzman constructed a computer simulation that he named MINERVA 2. This model was successful in predicting the basic findings from prototype abstraction experiments (such as the differential forgetting of prototypes and old exemplars, typicality, and variability effects), was able to retrieve the abstracted prototype of a category when cued with the category name, and retrieved a category name when cued with a category exemplar. This particular model, then, is able to account for a large proportion of the collected data with a memory representation model based purely on exemplar information.

Applications to Motor Behaviour

Despite the rather strong belief in schema abstraction, the literature seems clear on one point--a pure prototype abstraction model is unable to account for all the data collected. However, based on the work of Hintzman (1986), the same could not be stated for a pure exemplar based model of memorial representation and classification. That is, an exemplar model can account for all the data. However, Hintzman's demonstation of how his model matches the data is based on a computer simulation of human behaviour and raises the usual question concerning the use of artificial intelligence--because a computer can be programmed to perform a task in a certain way, does that mean this is the way the human mechanism also performs that task?

Of course, the importance of the ideas and concepts that were reviewed here, for motor behaviour, are dependent on the applicability of this work to our field. As mentioned in the introductory section of this paper, it is interesting to extend this work to the field of motor behaviour, although caution must be used as cognitive psychology models do not necessarily have direct applications to the performance of motor skills. The question that is being considered here seems to be a basic one for motor behaviour; that is, how are motor skills represented in memory and how does this memory representation interact with environmental information to produce a motor response? There appears to be a direct parallel between the representation of a conceptual category and the representation of a class of movements, and in the recognition and classification of a novel exemplar and the recognition and classification of a novel response. The need in motor behaviour is to go beyond this to the actual production of a response that is not directly mapped to the stimulus. Schmidt's schema theory has attempted to do this by adapting a pure prototypic abstraction model but, as pointed out in this review, the pure prototypic model has proven untenable in the cognitive psychology literature and no empirical research has been produced in the motor behaviour world to support the abstract representation hypothesis. Lee (1985), Solso, et al., (1986), and Solso and Raynis (1979) attempted to provide empirical evidence for the prototypic abstraction of movements that appears to directly parallel the prototypic abstraction of verbal material. However, the movements used in these studies were passively experienced by the subjects so that no conclusions can be drawn to the active production of motion.

It seems, then, that an obvious need for motor behaviour research is to investigate the question of motor skill representation in memory; that is, to question the assumption of a central, abstract model. It may be that a pure prototypic abstraction model, although untenable in cognition, provides the best description of the representation of a class of movements. However, given the literature reviewed in this paper, a consideration of the role that specific exemplar information plays in the representation and production of movement should be undertaken.

The logical beginning point would be to contrast a pure abstraction model, as is schema theory, with a pure exemplar model. Because a pure exemplar model for motor skill representation and movement production does not yet exist, it is necessary to "abstract" a new model from substantiated models in the cognitive psychology literature. (Please note that the model being proposed here is highly speculative and is only presented as a single possibility of an exemplar model for motor behaviour.)

During the acquisition of a class of movements, a memory trace is established each time an attempt at a skill is performed. This memory trace would contain the environmental conditions immediately prior to performance (Schmidt's initial conditions), the action plan used to accomplish the performance, and the resultant feedback from the performance (from both internal and external feedback sources). The action plan is considered to contain both the goal of the movement and the specific neuro-muscular pattern needed to accomplish the movement. During practice, then, a large number of memory traces corresponding to each attempt at a skill that contain the information sufficient to direct a future attempt of that skill would be established. When put into a transfer situation where a novel variation of the class of movements is required, the specific memory trace that is most similar to the transfer situation would be recalled and the action plan from that trace used to direct the attempt at the skill. The environmental conditions would act as a memory probe, activating a subset of long term memory that contains the traces most similar to the current conditions. This activated subset of long term memory could then be viewed as working memory (Baddely, 1978). The performer's task would then be to select the single trace that resulted in the most successful performance previously and use the information contained in the action plan of the memory trace to accomplish the required movement.

This modified exemplar model is a highly speculative description of a pure exemplar model for motor behaviour. Each performance of a skill is hypothesized as being stored in memory and performance during novel task transfer is seen as being influenced by only one memory trace. It could just as easily have been speculated that only memory traces of successful performances are stored, or that performance on the novel task is the result of a summation of information from all activated memory traces (a la Hintzman, 1986). However, at this point in time, the intention is to present a model that offers the starkest contrasts between schema abstraction and specific exemplar models that are possible.

Empirical comparisons between schema abstraction and specific exemplar models appear to be relatively straight forward procedures and could be accomplished by a number of different methods. One fruitful approach would be to consider novel task transfer, since this appears to have been a central concern of Schmidt in formulating schema theory. As noted for the cognitive literature, the categorization of a novel exemplar in a prototypic model is based on a comparison to the single representation of the category; i.e., the prototype. Therefore, the ability to classify a novel exemplar should be unaffected by its relationship with the exemplars experienced during the acquisition of the prototype. Similarly, according to a schema abstraction model, the performance of a novel movement in a transfer paradigm should be unaffected by the relationship of this movement to the specific movements experienced during a practice session that established the GMP and schemata for the class of movements. (This is assumming that all movements come from the same movement class.) On the other hand, specific exemplar models in cognition use a comparison between the novel exemplar and the specific exemplars previously experienced to allow for classification. If this model was to be found veridical for motor behaviour then an influence of the relationship between the novel transfer and previously experienced movements should be noted. Performance of a novel response that is contextually more similar to a previously experienced movement should be superior to a novel reponse less similar to the previously experienced movements. A second approach that could be used to distinguish between schema abstraction and specific exemplar models would be to consider the retention of information over time. Since schema abstraction models assume that a specific exemplar is retained only long enough to abstract the needed information for the formation of the memory representation, then following a sufficient retention interval, there should be no advantage to performing a previously experienced movement from a novel movement. Therefore, by considering novel task transfer and retention of movement information, a direct comparison between schema abstraction and specific exemplar models can be obtained.

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Appenidx B

Schedule of Practice

Days 1-5 for Experiment 1 and Days 1-4 for Experiment 2

Day 1

5 imagery trials exemplar A, tone only, no movement
10 trials, exemplar A, movement with tone
5 imagery trials exemplar B, tone only, no movement
10 trials, exemplar B, movement with tone
5 imagery trials exemplar C, tone only, no movement
10 trials, exemplar C, movement with tone
75 trials, 25 of each exemplar randomly presented, movement with tone
10 trials, exemplar A, tone then movement
10 trials, exemplar B, tone then movement
10 trials, exemplar C, tone then movement
75 trials, 25 of each exemplar randomly presented, tone then movement
10 trials, exemplar A, movement only
10 trials, exemplar B, movement only
10 trials, exemplar C, movement only
60 trials, 20 of each exemplar randomly presented, movement only

Day 2

5 imagery trials exemplar A, tone only, no movement
5 trials, exemplar A, movement with tone
5 imagery trials exemplar B, tone only, no movement
5 trials, exemplar B, movement with tone
5 imagery trials exemplar C, tone only, no movement
5 trials, exemplar C, movement with tone
45 trials, 15 of each exemplar randomly presented, movement with tone
5 trials, exemplar A, tone then movement
5 trials, exemplar B, tone then movement
5 trials, exemplar C, tone then movement
45 trials, 15 of each exemplar randomly presented, tone then movement
5 trials, exemplar A, movement only
5 trials, exemplar B, movement only
5 trials, exemplar C, movement only
165 trials, 55 of each exemplar randomly presented, movement only

Day 3

5 imagery trials exemplar A, tone only, no movement
5 trials, exemplar A, movement with tone
5 imagery trials exemplar B, tone only, no movement
5 trials, exemplar B, movement with tone
5 imagery trials exemplar C, tone only, no movement

5 trials, exemplar C, movement with tone
15 trials, 5 of each exemplar randomly presented, movement with tone
5 trials, exemplar A, tone then movement
5 trials, exemplar B, tone then movement
5 trials, exemplar C, tone then movement
15 trials, 5 of each exemplar randomly presented, tone then movement
5 trials, exemplar A, movement only
5 trials, exemplar B, movement only
5 trials, exemplar C, movement only
210 trials, 70 of each exemplar randomly presented, movement only

Day 4

5 imagery trials exemplar A, tone only, no movement
5 imagery trials exemplar B, tone only, no movement
5 imagery trials exemplar C, tone only, no movement
30 trials, 10 of each exemplar randomly presented, tone then movement
270 trials, 90 of each exemplar randomly presented, movement only

Day 5

60 trials, 20 of each exemplar randomly presented, movement only

Appendix C

KR Withdrawal Schedule

Schedule of KR Withdrawal during Acquisition

for Experiments 1 and 2

Day	Trial #	No. of Trials on Which KR Provided
1	1-300	All
2	1-185	All
	186-235	every 2nd
	236-300	every 3rd
3	1-105	All
	106-155	every 2nd
	156-200	every 3rd
	201-260	every 4th
	261-300	every 5th
4	1-30	All
	31-60	every 2nd
	61-90	every 3rd
	91-130	every 4th
	131-200	every 5th
	201-300	every 10th
5	1-10	All
	11-30	every 5th
	31-60	every 10th

Appendix D

Experimental Instructions

Welcome to the Motor Behaviour lab at LSU! We appreciate you taking some time to help us in our research work.

The purpose of this experiment is to train you to a very high level on a particular task. The task we want you to perform is a three-segment movement that you are to learn to do in exactly 1200 milliseconds. When making this movement, you will initially move from the start button to contact the button to the right at a 45 angle, then move directly across the board horizontally to contact a second button and then directly up to contact the third button. You will be asked to make this movement over varying distances, but always with the goal of completing the movement in exactly 1200 milliseconds. Look at the board. The start button is the one located nearest to the bottom edge. The three distances that you will be moving are designated by colours- the shortest distance is the "blue" movement, the medium distance is the "white" movement, and the longest distance is the "red" movement. At the start of each trial, one of the three lights that are located in the center of the board will be illuminated to indicate which of the three movements you will be required to perform on the next trial. Once you are aware of which movement you are going to do, depress the start button, and hold it down. After a short delay a tone will sound and you can perform the movement. PLEASE

NOTE THIS IS NOT A REACTION TIME EXPERIMENT! Wait for the tone to end before you begin the movement. If you begin to soon, this will be considered an error. After you have completed the movement, the experimenter will provide you with error information telling you how close to the 1200 msecond goal your movement was. After receiving the error information, identify the movement to be made, depress the start button, and wait for the tone so that you can try again.

To help you perform this task, a second tone that sounds for exactly 1200 mseconds will be used as an aid. Initially you will simply listen to the tone and imagine the movement, then attempt to move in concert with the tone. Finally, the tone will be slowly withdrawn so that eventually you will be performing without it occurring at all, which is the ultimate goal. The manner in which this tone will occur and the way in which you can make use of it will be explained to you at various stages in the experiment.

The experiment will take place over 5 consecutive days and requires 1 hour/day. You will be paid $3.00 for each session and there will be a $20.00 bonus to the subject who performs with the least amount of error. You will be paid following completion of the experiment. You must attend each day- if you miss a day it CAN NOT be made up and you will forfeit all the money you have earned to that point. Your enthusiasm is needed and appreciated and we are measuring your performance on EVERY trial, so please try the best you can throughout the experiment. Please be careful and accurate in your movements- missing a button is considered an error and errors will count against you.

Thanks for taking part- do you have any questions?

Appendix E

Computer Program

Experiment 1

```
1 TYPE = 0:RNO = 0: PRINT  CHR$ (4);"PR#3":Y = 0: PRINT : PRINT  CHR$ (4
   );"NOMON I,O,C"
2 PE = 49332:PO = 49328
3  POKE PO + 1,0: POKE PO,255: POKE PO + 1,4: POKE PO,0
4  POKE PE + 1,0: POKE PE,0: POKE PE + 1,4
10  PRINT : PRINT  CHR$ (4);"BLOAD FINAL": POKE 24576,0
20  REM   THE ABOVE STATEMENT LOADS THE MACHINE LANGUAGE PROGRAM
21  REM  THE MACHINE LANGUAGE PROGRAM IS STORED ON THE DISK FROM WHICH
22  REM  WHICH IT IS LOADED ON TO HEX 6000 ONWARDS FOR HEX 200 BYTES
23  REM  HEX 6100 ONWARDS IS THE ACTUAL TIMING WHERE IT READS THE TIME
24  REM  AND 6180 IS WHERE THE READING OF THE BUTTONS PRESSED IS DONE
25  REM  AND AS THE SWITCHES ARE PRESSED THE TIMING ROUTINE IS CALLED.
30  DIM T(7),Q(65),MTYPE(41),REACTT(41)
40  DIM XMLPR(41): REM        STORES XMPLRS FOR ANY     TRIALS
50  DIM E$(5): REM    TO STORE THE SEQUENCE OF EXMPLARS
60  DIM SEG(3,41): REM       TO STORE THE SEGMENT TIMES
70  DIM SWT(2,41): REM     TO STORE THE TIME SPENT ON EACH SWITCH
80 OPEN = 0:TRANSFER = 0: REM  DATA FILE CLOSED=>0 AND TRANSFER TRIALS
90  REM  NOT BEING PERFORMED AT PRESENT
100  HOME
110  VTAB (12): HTAB (4): PRINT "WELCOME TO THE EXPERIMENT"
120  VTAB (20): HTAB (4): PRINT "PRESS ANY KEY TO CONTINUE": GET Z$
130  HOME : VTAB (8): PRINT "WHICH DAY IS IT (1--6) ?";: GET DAY: PRINT
   DAY
140  IF DAY < 1 OR DAY > 6 THEN 130
145  PRINT "IS THAT ALRIGHT (Y/N)": GET Z$: IF Z$ <  > "Y" THEN 130
146  HOME
147  VTAB (12)
150  PRINT "REMOVE PROGRAM DISK AND PUT DATA DISK IN DRIVE"
160  VTAB (20): HTAB (4): PRINT "PRESS ANY KEY TO CONTINUE": GET Z$
168  HOME
170  VTAB (5): INPUT "INPUT NAME OF THE SUBJECT? ";SNAME$: IF SNAME$ = "
   " THEN 170
180  VTAB (8): INPUT "INPUT THE ID ?";ID: IF ID < 1 OR ID > 1000 THEN 18
   0
190  VTAB (8): HTAB (28): PRINT "SEX$ ";: GET SEX$: PRINT SEX$: IF SEX$ <
   > "F" AND SEX$ <  > "M" THEN 190
200  VTAB (20): PRINT "IS ALL THE INFORMATION CORRECT(Y/N)?";: GET Z$: IF
   Z$ <  > "Y" THEN 170
210  REM   FOR GETTING THE SEQUENCE IN WHICH THE TASKS HAVE TO BE DONE
220  HOME
225  IF DAY >  = 5 THEN 300
230  FOR I = 1 TO 3
240  VTAB (4 * I)
250  PRINT "TYPE THE LETTER OF THE ";I;" TH TASK ";
260  GET Q$: PRINT Q$:E$(I) = Q$: IF Q$ <  > "A" AND Q$ <  > "B" AND Q$ <
   > "C" THEN 240
270  NEXT I: VTAB (20)
280  PRINT "IS THAT ALRIGHT (Y/N) ";: GET Z$
290  IF Z$ <  > "Y" THEN 220
300 PE = 49332:PO = 49328
310  POKE PO + 1,0: POKE PO,255: POKE PO + 1,4: POKE PO,0
320  POKE PE + 1,0: POKE PE,0: POKE PE + 1,4
400 VADAY = DAY: HOME : PRINT VADAY
410  ON VADAY GOSUB 1000,2000,3000,4000,5000,5500
420  END
1000  REM  DAY 1 STARTS
1010  REM  ************************************************************
1015 DEX = 1
1020  FOR I = 1 TO 3
1040  FOR J = 1 TO 5:XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 11000:
   NEXT J
1050  FOR J = 1 TO 10:MTYPE(DEX) = 2
1052 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 12000:DEX = DEX + 1
1053  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
1054  NEXT J
1060  NEXT I
1065 FINISHED = 30: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
1080 SUM = 75: GOSUB 13000:DEX = 1
1090  FOR I = 1 TO 3
1110  FOR J = 1 TO 10:MTYPE(DEX) = 4
1114 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 14000:DEX = DEX + 1
1115  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
1116  NEXT J
1120  NEXT I
1125 FINISHED = 30: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
1130 SUM = 75: GOSUB 15000:DEX = 1
```

```
1140  FOR I = 1 TO 3
1160  FOR J = 1 TO 10:MTYPE(DEX) = 6
1162 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 16000:DEX = DEX + 1
1163  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
1164  NEXT J
1170  NEXT I
1175 FINISHED = 30: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
1180 SUM = 60: GOSUB 17000:DEX = 1
1190  RETURN
2000  REM   DAY 2 STARTS
2010  REM    *************************************************************
2015 DEX = 1
2020  FOR I = 1 TO 3
2040  FOR J = 1 TO 5:XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 11000:
    NEXT J
2050  FOR J = 1 TO 5:MTYPE(DEX) = 2
2052 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 12000:DEX = DEX + 1
2053  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
2054  NEXT J
2060  NEXT I
2065 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
2080 SUM = 45: GOSUB 13000:DEX = 1
2090  FOR I = 1 TO 3
2110  FOR J = 1 TO 5:MTYPE(DEX) = 4
2114 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 14000:DEX = DEX + 1
2115  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
2116  NEXT J
2120  NEXT I
2125 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
2130 SUM = 45: GOSUB 15000:DEX = 1
2140  FOR I = 1 TO 3
2160  FOR J = 1 TO 5:MTYPE(DEX) = 6
2162 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 16000:DEX = DEX + 1
2163  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
2164  NEXT J
2170  NEXT I
2175 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
2180 SUM = 165: GOSUB 17000:DEX = 1
2190  RETURN
3000  REM    DAY 3 STARTS
3010  REM        *******************************************************
3015 DEX = 1
3020  FOR I = 1 TO 3
3040  FOR J = 1 TO 5:XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 11000:
    NEXT J
3050  FOR J = 1 TO 5:MTYPE(DEX) = 2
3052 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 12000:DEX = DEX + 1
3053  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
3054  NEXT J
3060  NEXT I
3065 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
3080 SUM = 15: GOSUB 13000:DEX = 1
3090  FOR I = 1 TO 3
3110  FOR J = 1 TO 5:MTYPE(DEX) = 4
3114 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 14000:DEX = DEX + 1
3115  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
3116  NEXT J
3120  NEXT I
3125 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
3130 SUM = 15: GOSUB 15000:DEX = 1
3140  FOR I = 1 TO 3
3150 DEX = 1
3160  FOR J = 1 TO 5:MTYPE(DEX) = 6
3162 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 16000:DEX = DEX + 1
3163  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
3164  NEXT J
3170  NEXT I
3175 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
3180 SUM = 225: GOSUB 17000:DEX = 1
3190  RETURN
4000  REM  DAY 4 STARTS
4010  REM     ************************************************************
4020  FOR I = 1 TO 3
4040  FOR J = 1 TO 5:XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 11000:
   DEX = DEX + 1: NEXT J
4045 DEX = 1
4050  NEXT I
4060 SUM = 30: GOSUB 15000:DEX = 1
4070 SUM = 270: GOSUB 17000:DEX = 1
4080  RETURN
```

```
5000  REM  DAY 5 STARTS
5010  REM    ****************************************************************
5012 E$(1) = "A"
5014 E$(2) = "B"
5016 E$(3) = "C"
5020 SUM = 60: GOSUB 17000: HOME
5030  VTAB (12): HTAB (4): PRINT "WAIT FOR 5 MINUTES": PRINT
5040  HTAB (4): VTAB (16): PRINT "GET READY FOR TRANSFER TRAILS"
5050  RETURN
5500  REM   DAY 6 STARTS
5510  REM     ***************************************************************

5520 SUM = 40: GOSUB 18000
5530  RETURN
5999  REM  *********************************************
6000  REM  THIS ROUTINE IS TO DISPLAY WHICH EXMPLR IS TO BE DONE
6001  HOME
6005 RNO = RNO + 1
6009  VTAB (1): HTAB (1)
6010  PRINT "     TRIAL NUMBER =";RNO;" (INCLUDING IMAGERY) "
6012 TMT = T(7) - T(2)
6013 ERR = 1200 - TMT: VTAB (6): HTAB (25)
6014  PRINT ERR;
6015  IF ERR >  = 0 THEN 6017
6016  IF ERR < 0 THEN 6018
6017  PRINT "  TOO FAST": GOTO 6020
6018  PRINT "  TOO SLOW": GOTO 6020
6020  VTAB (10): HTAB (25): PRINT "THE NEXT EXEMPLER IS "; CHR$ (XMPLR(D
    EX))
6030  VTAB (20): PRINT "TYPE ANY KEY TO CONTINUE"
6031  IF XMPLR(DEX) =  ASC ("A") OR XMPLR(DEX) =  ASC ("D") THEN DOP = 1

6032  IF XMPLR(DEX) =  ASC ("B") OR XMPLR(DEX) =  ASC ("E") THEN DOP = 2

6033  IF XMPLR(DEX) =  ASC ("C") OR XMPLR(DEX) =  ASC ("F") THEN DOP = 4

6034  IF XMPLR(DEX) =  ASC ("G") THEN DOP = 8
6036  POKE PO,DOP
6040  GET Z$
6045  POKE PO,0
6050  RETURN
7000  REM  *********************TO CALCULATE THE SWITCH TIMES*******
7010  REM  THIS ROUTINE CALL THE TIME ROUTINE WHENEVER THE TIME NEEDS
7020  REM  TO BE CALCULATED. IT WAITS FOR THE APPROPIATE BUTTONS TO BE
7030  REM  PRESSED AND THEN CALLS THE TIME ROUTINE
7040  REM  CALCULATE TIME 0
7200  REM  THIS CALCULATES THE TIMES BETWEEN BUTTONS
7210 REACTT(DEX) = T(2) - T(1)
7220 SEG(1,DEX) = T(3) - T(2)
7230 SWT(1,DEX) = T(4) - T(3)
7240 SEG(2,DEX) = T(5) - T(4)
7250 SWT(2,DEX) = T(6) - T(5)
7260 SEG(3,DEX) = T(7) - T(6)
7270  IF SEG(1,DEX) > 750 OR SEG(2,DEX) > 750 OR SEG(3,DEX) > 750 OR REA
    CTT(DEX) < 1 THEN QERR = 1:RNO = RNO - 1: PRINT "PERFORMING AGAIN
          ": GET Z$
7300  RETURN
7999  REM  ***********************SAVE DATA************************
8000  REM  THIS ROUTINE IS TO FORMAT AND SAVE THE DATA
8010  HOME : HTAB (35): VTAB (10): PRINT "SAVING DATA"
8020  HTAB (34): VTAB (18): PRINT "PLEASE WAIT..."
8030  REM
8040  REM
8050  PRINT  CHR$ (4)
8060  PRINT  CHR$ (4);"OPEN";SNAME$;",D1"
8070  IF VADAY > 1 OR OPEN = 1 THEN  PRINT  CHR$ (4);"APPEND";SN$;",D1":
     GOTO 8100
8080  PRINT  CHR$ (4);"DELETE";SNAME$
8090  PRINT  CHR$ (4);"OPEN";SNAME$
8100  PRINT  CHR$ (4);"WRITE";SNAME$
8110 OPEN = 1
8200  FOR OSRI = 1 TO FINISHED
8210 PTRNO = PTRNO + 1
8220  FOR OOSRI = 1 TO 60:Q(OOSRI) = 32: NEXT OOSRI
8230 Q(1) =  ASC ( STR$ (DAY))
8250  ON  LEN ( STR$ (PTRNO)) GOSUB 8260,8270,8280: GOTO 8300
8260 Q(5) =  ASC ( STR$ (PTRNO)): RETURN
8270 Q(4) =  ASC ( STR$ ( INT (PTRNO / 10))):Q(5) =  ASC ( STR$ (PTRNO -
     INT (PTRNO / 10) * 10)): RETURN
8280 Q(3) =  ASC ( STR$ (PTRNO / 100)):Q(4) =  ASC ( STR$ ( INT (PTRNO /
    10) -  INT (PTRNO / 100) * 10)):Q(5) =  ASC ( STR$ (PTRNO -  INT (PT
    RNO / 10) * 10)): RETURN
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```
8300  ON  LEN ( STR$ (ID)) GOSUB 8310,8320,8330: GOTO 8340
8310 Q(9) =  ASC ( STR$ (ID)): RETURN
8320 Q(8) =  ASC ( STR$ ( INT (ID / 10))):Q(9) =  ASC ( STR$ (ID -  INT
    (ID / 10) * 10)): RETURN
8330 Q(7) =  ASC ( STR$ (ID / 100)):Q(8) =  ASC ( STR$ ( INT (ID / 10) -
     INT (ID / 100) * 10)):Q(9) =  ASC ( STR$ (ID -  INT (ID / 10) * 10)
    ): RETURN
8340 Q(11) = XMPLR(OSRI)
8350 Q(13) =  ASC ( STR$ (TYPE))
8360 Q(15) =  ASC (SEX$)
8370 Q(17) =  ASC ( STR$ (MTYPE(OSRI)))
8400  IF REACTT(OSRI) < 0 THEN Q(19) =  ASC ("-")
8405  ON  LEN ( STR$ (REACTT(OSRI))) GOSUB 8410,8420,8430,8435: GOTO 844
    0
8410 Q(22) =  ASC ( STR$ (REACTT(OSRI))): RETURN
8420 Q(21) =  ASC ( STR$ ( INT (REACTT(OSRI) / 10))):Q(22) =  ASC ( STR$
    (REACTT(OSRI) -  INT (REACTT(OSRI) / 10) * 10)): RETURN
8430 Q(20) =  ASC ( STR$ (REACTT(OSRI) / 100)):Q(21) =  ASC ( STR$ ( INT
    (REACTT(OSRI) / 10) -  INT (REACTT(OSRI) / 100) * 10)):Q(22) =  ASC
    ( STR$ (REACTT(OSRI) -  INT (REACTT(OSRI) / 10) * 10)): RETURN
8435 Q(19) =  ASC ( STR$ ( INT (REACTT(OSRI) / 1000))):Q(20) =  ASC ( STR$
    ( INT (REACTT(OSRI) / 100) -  INT (REACTT(OSRI) / 1000) * 10)):Q(21)
     =  ASC ( STR$ ( INT (REACTT(OSRI) / 10) -  INT (REACTT(OSRI) / 1000
    ) * 100)):Q(22) =  ASC ( STR$ (REACTT(OSRI) -  INT (REACTT(OSRI) / 1
    0) * 10)): RETURN
8440  IF SEG(1,OSRI) < 0 THEN Q(24) =  ASC ("-")
8445  ON  LEN ( STR$ (SEG(1,OSRI))) GOSUB 8450,8460,8470: GOTO 8500
8450 Q(27) =  ASC ( STR$ (SEG(1,OSRI))): RETURN
8460 Q(26) =  ASC ( STR$ ( INT (SEG(1,OSRI) / 10))):Q(27) =  ASC ( STR$
    (SEG(1,OSRI) -  INT (SEG(1,OSRI) / 10) * 10)): RETURN
8470 Q(25) =  ASC ( STR$ (SEG(1,OSRI) / 100)):Q(26) =  ASC ( STR$ ( INT
    (SEG(1,OSRI) / 10) -  INT (SEG(1,OSRI) / 100) * 10)):Q(27) =  ASC ( STR$
    (SEG(1,OSRI) -  INT (SEG(1,OSRI) / 10) * 10)): RETURN
8500  IF SWT(1,OSRI) < 0 THEN Q(29) =  ASC ("-")
8505  ON  LEN ( STR$ (SWT(1,OSRI))) GOSUB 8510,8520,8530: GOTO 8550
8510 Q(32) =  ASC ( STR$ (SWT(1,OSRI))): RETURN
8520 Q(31) =  ASC ( STR$ ( INT (SWT(1,OSRI) / 10))):Q(32) =  ASC ( STR$
    (SWT(1,OSRI) -  INT (SWT(1,OSRI) / 10) * 10)): RETURN
8530 Q(30) =  ASC ( STR$ (SWT(1,OSRI) / 100)):Q(31) =  ASC ( STR$ ( INT
    (SWT(1,OSRI) / 10) -  INT (SWT(1,OSRI) / 100) * 10)):Q(32) =  ASC ( STR$
    (SWT(1,OSRI) -  INT (SWT(1,OSRI) / 10) * 10)): RETURN
8550  IF SEG(2,OSRI) < 0 THEN Q(34) =  ASC ("-")
8555  ON  LEN ( STR$ (SEG(2,OSRI))) GOSUB 8560,8570,8580: GOTO 8600
8560 Q(37) =  ASC ( STR$ (SEG(2,OSRI))): RETURN
8570 Q(36) =  ASC ( STR$ ( INT (SEG(2,OSRI) / 10))):Q(37) =  ASC ( STR$
    (SEG(2,OSRI) -  INT (SEG(2,OSRI) / 10) * 10)): RETURN
8580 Q(35) =  ASC ( STR$ (SEG(2,OSRI) / 100)):Q(36) =  ASC ( STR$ ( INT
    (SEG(2,OSRI) / 10) -  INT (SEG(2,OSRI) / 100) * 10)):Q(37) =  ASC ( STR$
    (SEG(2,OSRI) -  INT (SEG(2,OSRI) / 10) * 10)): RETURN
8600  IF SWT(2,OSRI) < 0 THEN Q(39) =  ASC ("-")
8605  ON  LEN ( STR$ (SWT(2,OSRI))) GOSUB 8610,8620,8630: GOTO 8650
8610 Q(42) =  ASC ( STR$ (SWT(2,OSRI))): RETURN
8620 Q(41) =  ASC ( STR$ ( INT (SWT(2,OSRI) / 10))):Q(42) =  ASC ( STR$
    (SWT(2,OSRI) -  INT (SWT(2,OSRI) / 10) * 10)): RETURN
8630 Q(40) =  ASC ( STR$ (SWT(2,OSRI) / 100)):Q(41) =  ASC ( STR$ ( INT
    (SWT(2,OSRI) / 10) -  INT (SWT(2,OSRI) / 100) * 10)):Q(42) =  ASC ( STR$
    (SWT(2,OSRI) -  INT (SWT(2,OSRI) / 10) * 10)): RETURN
8650  IF SEG(3,OSRI) < 0 THEN Q(44) =  ASC ("-")
8655  ON  LEN ( STR$ (SEG(3,OSRI))) GOSUB 8660,8670,8680: GOTO 8800
8660 Q(47) =  ASC ( STR$ (SEG(3,OSRI))): RETURN
8670 Q(46) =  ASC ( STR$ ( INT (SEG(3,OSRI) / 10))):Q(47) =  ASC ( STR$
    (SEG(3,OSRI) -  INT (SEG(3,OSRI) / 10) * 10)): RETURN
8680 Q(45) =  ASC ( STR$ (SEG(3,OSRI) / 100)):Q(46) =  ASC ( STR$ ( INT
    (SEG(3,OSRI) / 10) -  INT (SEG(3,OSRI) / 100) * 10)):Q(47) =  ASC ( STR$
    (SEG(3,OSRI) -  INT (SEG(3,OSRI) / 10) * 10)): RETURN
8800  FOR OOSRI = 1 TO 60: PRINT  CHR$ (Q(OOSRI));: NEXT OOSRI
8810  PRINT
8900  NEXT OSRI
8910  PRINT  CHR$ (4);"CLOSE";SNAME$
8920  HOME :A =  FRE (0): PRINT A: GET Z$
8930  PRINT : PRINT  CHR$ (4);"BLOAD FINAL": POKE 24576,0
8990  RETURN
9000  REM  ****************TIMER ROUTINE****************************
9004  POKE PO,0
9005  POKE 24576,0
9006  IF Y = 1 THEN  CALL 25088
9007  IF Y = 0 THEN  CALL 24960
9011  POKE 24578,0
9012  POKE 24577,0
9013  POKE PO,0
9020  FOR ZO = 0 TO 6
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9030 X1 =  PEEK (24586 + ZO * 5)
9040 X2 =  PEEK (24587 + ZO * 5)
9050 P2 = 1
9060 M0 = 0
9070 M2 = 0
9080  FOR Z1 = 1 TO 4
9090 M0 = P2 *  INT (X1 - ( INT (X1 / 2) * 2)) + M0
9100 M2 = P2 *  INT (X2 - ( INT (X2 / 2) * 2)) + M2
9110 P2 = P2 * 2
9120 X1 =  INT (X1 / 2):X2 =  INT (X2 / 2)
9130  NEXT Z1
9140 M1 = X1
9150 M3 = X2
9160 M4 = M3 +  PEEK (24588 + ZO * 5) * 16 +  PEEK (24589 + ZO * 5) * 40
    96 +  PEEK (24590 + ZO * 5) * 1048576
9170  IF ZO = 0 THEN M5 =  INT (M4 / 10000) * 10000
9180 T(ZO + 1) = (M4 - M5) * 1000 + M0 + M1 * 10 + M2 * 100
9190  NEXT ZO
9410  GOSUB 7000
9500  RETURN
10000  PRINT  CHR$ (4)
10010  PRINT  CHR$ (4);"IN#4"
10020  PRINT  CHR$ (4);"PR#4"
10030  INPUT " ";T$
10040  PRINT  CHR$ (4);"PR#0"
10045  PRINT  CHR$ (4);"PR#3"
10050  PRINT  CHR$ (4);"IN#0"
10060 H =  VAL ( MID$ (T$,7,2))
10070 M =  VAL ( MID$ (T$,10,2))
10080 S =  VAL ( MID$ (T$,13,2))
10090 MS =  VAL ( RIGHT$ (T$,3))
10100 TIME = H * 3600000 + M * 60000 + S * 1000 + MS
10110  RETURN
10500  GOSUB 10000:ITIME = TIME
10510  GOSUB 10000:ELTIME = TIME - ITIME: IF ELTIME < DLY THEN 10510
10520  RETURN
11000  REM   ************CONDITION 1****************************
11010  REM   CONDITION 1 - TONE ONLY FOR TIME SPECIFIED
11020  REM     THE INPUT  TO THIS ROUTINE IS TIME
11030  REM    FOR WHICH THE BUZZER IS TO BE KEPT ON
11040  REM   AND EXITS ONLY AFTER THE BUZZER'S ON TIME IS UP
11062  POKE PO,64:DLY = 50: GOSUB 10500: POKE PO,0
11063 DLY = 500: GOSUB 10500: POKE PO,128
11070 DLY = 1200: GOSUB 10500
11080  POKE PO,0
11090  RETURN
12000  REM   ************CONDITION 2****************************
12010  REM    CONDITION 2 - TONE WITH MOVEMENT
12011 PO = 49328
12014 DLY = 50: POKE PO,64: GOSUB 10500: POKE PO,0
12030 Y = 1: GOSUB 9000:Y = 0
12040  RETURN
13000  REM   ************CONDITION 3****************************
13005  REM  CONDITION 3 -RANDOM MOVEMENT WITH TONE
13006 DEX = 1:TSRI = 0
13010  FOR S33 = 1 TO 3:P(S33) = 0: NEXT S33
13020  FOR S33 = 1 TO SUM
13030 WHICH =  INT (( RND (1) * 3) + 1)
13035  IF P(WHICH) >  = (SUM / 3) THEN 13030
13040 P(WHICH) = P(WHICH) + 1
13045 MTYPE(DEX) = 3
13050 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 12000
13051  IF QERR = 1 THEN DEX = DEX - 1:TSRI = TSRI - 1:S33 = S33 - 1:P(WH
    ICH) = P(WHICH) - 1:QERR = 0
13055 DEX = DEX + 1
13056 TSRI = TSRI + 1
13057  IF TSRI >  = 30 THEN TSRI = 0:FINISHED = 30: GOSUB 21000: GOSUB 8
    000:FINISHED = 0:DEX = 1
13090  NEXT S33
13100  IF TSRI <  > 0 THEN FINISHED = TSRI: GOSUB 21000: GOSUB 8000:FINI
    SHED = 0:DEX = 1:TSRI = 0
13110  RETURN
14000  REM    ************CONDITION 4****************************
14010  REM    CONDITION 4 TONE THEN MOVEMENT
14030  GOSUB 11000
14040  GOSUB 9000
14050  RETURN
15000  REM    ************CONDITION 5****************************
15010  REM     CONDITION 5 RANDOM TONE THEN MOVEMENT
15015 DEX = 1
15020  FOR S55 = 1 TO 3:P(S55) = 0: NEXT S55
15025 TSRI = 0
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15030  FOR S55 = 1 TO SUM
15040 WHICH =  INT (( RND (1) * 3) + 1)
15050  IF P(WHICH) >  = (SUM / 3) THEN 15040
15060 P(WHICH) = P(WHICH) + 1
15065 MTYPE(DEX) = 5
15066 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 14000
15067  IF QERR = 1 THEN DEX = DEX - 1:TSRI = TSRI - 1:S55 = S55 - 1:P(WH
    ICH) = P(WHICH) - 1:QERR = 0
15077 DEX = DEX + 1
15078 TSRI = TSRI + 1
15079  IF TSRI >  = 30 THEN TSRI = 0:FINISHED = 30: GOSUB 21000: GOSUB 8
    000:FINISHED = 0:DEX = 1
15090  NEXT S55
15100  IF TSRI <  > 0 THEN FINISHED = TSRI: GOSUB 21000: GOSUB 8000:FINI
    SHED = 0:DEX = 1:TSRI = 0
15110  RETURN
16000  REM    ************CONDITION 6****************************
16010  REM     CONDITION 6 -MOVEMENT ONLY
16020 DLY = 50: POKE PO,64: GOSUB 10500: POKE PO,0
16030  REM  START GETTING KEYS AS INPUTS
16040  REM  STORE DATA AT THE END OF EACH DAY
16045  GOSUB 9000
16050  RETURN
17000  REM    ************CONDITION 7****************************
17010  REM     CONDITION 7-RANDOM MOVEMENT ONLY
17011 TSRI = 0:DEX = 1
17020  FOR S77 = 1 TO 3:P(S77) = 0: NEXT S77
17030  FOR S77 = 1 TO SUM
17040 WHICH =  INT (( RND (1) * 3) + 1)
17050  IF P(WHICH) >  = (SUM / 3) THEN 17040
17060 P(WHICH) = P(WHICH) + 1
17061 MTYPE(DEX) = 7
17062 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 16000
17063  IF QERR = 1 THEN DEX = DEX - 1:S77 = S77 - 1:TSRI = TSRI - 1:QERR
     = 0:P(WHICH) = P(WHICH) - 1
17073 DEX = DEX + 1
17074 TSRI = TSRI + 1
17075  IF TSRI >  = 30 THEN TSRI = 0:FINISHED = 30: GOSUB 21000: GOSUB 8
    000:FINISHED = 0:DEX = 1
17090  NEXT S77
17100  IF TSRI <  > 0 THEN FINISHED = TSRI: GOSUB 21000: GOSUB 8000:FINI
    SHED = 0:DEX = 1:TSRI = 0
17110  RETURN
18000  REM     ************CONDITION 8****************************
18010  REM      CONDITION 8-RANDOM TRANSFER TRIALS
18011 TSRI = 0:DEX = 1:TYPE = 1
18012 E$(1) = "D"
18013 E$(2) = "E"
18014 E$(3) = "F"
18015 E$(4) = "G"
18020  FOR S77 = 1 TO 3:P(S77) = 0: NEXT S77
18030  FOR S77 = 1 TO SUM
18040 WHICH =  INT (( RND (3) * 4) + 1)
18050  IF P(WHICH) >  = (SUM / 4) THEN 18040
18060 P(WHICH) = P(WHICH) + 1
18061 MTYPE(DEX) = 8
18062 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 16000
18063  IF QERR = 1 THEN DEX = DEX - 1:TSRI = TSRI - 1:S77 = S77 - 1:P(WH
    ICH) = P(WHICH) - 1:QERR = 0
18073 DEX = DEX + 1
18074 TSRI = TSRI + 1
18075  IF TSRI >  = 40 THEN TSRI = 0:FINISHED = 40: GOSUB 21000: GOSUB 8
    000:FINISHED = 0:DEX = 1
18090  NEXT S77
18100  IF TSRI <  > 0 THEN FINISHED = TSRI: GOSUB 21000: GOSUB 8000:FINI
    SHED = 0:DEX = 1:TSRI = 0
18110  RETURN
19999  REM  ***************TO PRINT THE PROMPT**********************
21000 TMT = T(7) - T(2)
21005  HOME
21010 ERR = 1200 - TMT: VTAB (6): HTAB (25)
21020  PRINT ERR;
21030  IF ERR >  = 0 THEN 21050
21040  IF ERR < 0 THEN 21060
21050  PRINT "  TOO FAST": GOTO 21065
21060  PRINT "  TOO SLOW"
21065  VTAB (20): HTAB (4): PRINT "PRESS ANY KEY TO CONTINUE SAVING DATA
    ": GET Z$
21070  RETURN
```

Experiment 2

```
1 TYPE = 0:RNO = 0: PRINT  CHR$ (4);"PR#3":Y = 0: PRINT : PRINT  CHR$ (4
    );"NOMON I,O,C"
2 PE = 49332:PO = 49328
3  POKE PO + 1,0: POKE PO,255: POKE PO + 1,4: POKE PO,0
4  POKE PE + 1,0: POKE PE,0: POKE PE + 1,4
10  PRINT : PRINT  CHR$ (4);"BLOAD FINAL": POKE 24576,0
20  REM   THE ABOVE STATEMENT LOADS THE MACHINE LANGUAGE PROGRAM
21  REM  THE MACHINE LANGUAGE PROGRAM IS STORED ON THE DISK FROM WHICH
22  REM  WHICH IT IS LOADED ON TO HEX 6000 ONWARDS FOR HEX 200 BYTES
23  REM  HEX 6100 ONWARDS IS THE ACTUAL TIMING WHERE IT READS THE TIME
24  REM  AND 6180 IS WHERE THE READING OF THE BUTTONS PRESSED IS DONE
25  REM  AND AS THE SWITCHES ARE PRESSED THE TIMING ROUTINE IS CALLED.
30  DIM T(7),Q(65),MTYPE(50),REACTT(50)
40  DIM XMLPR(50): REM        STORES XMPLRS FOR ANY     TRIALS
50  DIM E$(5): REM    TO STORE THE SEQUENCE OF EXMPLARS
60  DIM SEG(3,50): REM        TO STORE THE SEGMENT TIMES
70  DIM SWT(2,50): REM      TO STORE THE TIME SPENT ON EACH SWITCH
80 OPEN = 0:TRANSFER = 0: REM  DATA FILE CLOSED=>0 AND TRANSFER TRIALS
90  REM  NOT BEING PERFORMED AT PRESENT
100  HOME
110  VTAB (12): HTAB (4): PRINT "WELCOME TO THE EXPERIMENT"
120  VTAB (20): HTAB (4): PRINT "PRESS ANY KEY TO CONTINUE": GET Z$
130  HOME : VTAB (8): PRINT "WHICH DAY IS IT (1--6) ?";: GET DAY: PRINT
    DAY
140  IF DAY < 1 OR DAY > 6 THEN 130
145  PRINT "IS THAT ALRIGHT (Y/N)": GET Z$: IF Z$ <  > "Y" THEN 130
146  HOME
147  VTAB (12)
150  PRINT "REMOVE PROGRAM DISK AND PUT DATA DISK IN DRIVE"
160  VTAB (20): HTAB (4): PRINT "PRESS ANY KEY TO CONTINUE": GET Z$
168  HOME
170  VTAB (5): INPUT "INPUT NAME OF THE SUBJECT? ";SNAME$: IF SNAME$ = "
    " THEN 170
180  VTAB (8): INPUT "INPUT THE ID ?";ID: IF ID < 1 OR ID > 1000 THEN 18
    0
190  VTAB (8): HTAB (28): PRINT "SEX$ ";: GET SEX$: PRINT SEX$: IF SEX$ <
    > "F" AND SEX$ <  > "M" THEN 190
200  VTAB (20): PRINT "IS ALL THE INFORMATION CORRECT(Y/N)?";: GET Z$: IF
    Z$ <  > "Y" THEN 170
210  REM   FOR GETTING THE SEQUENCE IN WHICH THE TASKS HAVE TO BE DONE
220  HOME
225  IF DAY >  = 5 THEN 300
230  FOR I = 1 TO 3
240  VTAB (4 * I)
250  PRINT "TYPE THE LETTER OF THE ";I;" TH TASK ";
260  GET Q$: PRINT Q$:E$(I) = Q$: IF Q$ <  > "A" AND Q$ <  > "B" AND Q$ <
    > "C" THEN 240
270  NEXT I: VTAB (20)
280  PRINT "IS THAT ALRIGHT (Y/N) ";: GET Z$
290  IF Z$ <  > "Y" THEN 220
300 PE = 49332:PO = 49328
310  POKE PO + 1,0: POKE PO,255: POKE PO + 1,4: POKE PO,0
320  POKE PE + 1,0: POKE PE,0: POKE PE + 1,4
400 VADAY = DAY: HOME : PRINT VADAY
410  ON VADAY GOSUB 1000,2000,3000,4000,5000,5500
420  END
1000  REM  DAY 1 STARTS
1010  REM   ***************************************************************
1015 DEX = 1
1020  FOR I = 1 TO 3
1040  FOR J = 1 TO 5:XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 11000:
    NEXT J
1050  FOR J = 1 TO 10:MTYPE(DEX) = 2
1052 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 12000:DEX = DEX + 1
1053  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
1054  NEXT J
1060  NEXT I
1065 FINISHED = 30: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
1080 SUM = 75: GOSUB 13000:DEX = 1
1090  FOR I = 1 TO 3
1110  FOR J = 1 TO 10:MTYPE(DEX) = 4
1114 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 14000:DEX = DEX + 1
1115  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
1116  NEXT J
1120  NEXT I
1125 FINISHED = 30: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
1130 SUM = 75: GOSUB 15000:DEX = 1
```

```
1140  FOR I = 1 TO 3
1160  FOR J = 1 TO 10:MTYPE(DEX) = 6
1162 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 16000:DEX = DEX + 1
1163  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
1164  NEXT J
1170  NEXT I
1175 FINISHED = 30: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
1180 SUM = 60: GOSUB 17000:DEX = 1
1190  RETURN
2000  REM   DAY 2 STARTS
2010  REM    ************************************************************
2015 DEX = 1
2020  FOR I = 1 TO 3
2040  FOR J = 1 TO 5:XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 11000:
     NEXT J
2050  FOR J = 1 TO 5:MTYPE(DEX) = 2
2052 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 12000:DEX = DEX + 1
2053  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
2054  NEXT J
2060  NEXT I
2065 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
2080 SUM = 45: GOSUB 13000:DEX = 1
2090  FOR I = 1 TO 3
2110  FOR J = 1 TO 5:MTYPE(DEX) = 4
2114 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 14000:DEX = DEX + 1
2115  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
2116  NEXT J
2120  NEXT I
2125 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
2130 SUM = 45: GOSUB 15000:DEX = 1
2140  FOR I = 1 TO 3
2160  FOR J = 1 TO 5:MTYPE(DEX) = 6
2162 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 16000:DEX = DEX + 1
2163  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
2164  NEXT J
2170  NEXT I
2175 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
2180 SUM = 165: GOSUB 17000:DEX = 1
2190  RETURN
3000  REM    DAY 3 STARTS
3010  REM        *********************************************************
3015 DEX = 1
3020  FOR I = 1 TO 3
3040  FOR J = 1 TO 5:XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 11000:
     NEXT J
3050  FOR J = 1 TO 5:MTYPE(DEX) = 2
3052 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 12000:DEX = DEX + 1
3053  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
3054  NEXT J
3060  NEXT I
3065 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
3080 SUM = 15: GOSUB 13000:DEX = 1
3090  FOR I = 1 TO 3
3110  FOR J = 1 TO 5:MTYPE(DEX) = 4
3114 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 14000:DEX = DEX + 1
3115  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
3116  NEXT J
3120  NEXT I
3125 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
3130 SUM = 15: GOSUB 15000:DEX = 1
3140  FOR I = 1 TO 3
3150 DEX = 1
3160  FOR J = 1 TO 5:MTYPE(DEX) = 6
3162 XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 16000:DEX = DEX + 1
3163  IF QERR = 1 THEN DEX = DEX - 1:J = J - 1:QERR = 0
3164  NEXT J
3170  NEXT I
3175 FINISHED = 15: GOSUB 21000: GOSUB 8000:FINISHED = 0:DEX = 1
3180 SUM = 225: GOSUB 17000:DEX = 1
3190  RETURN
4000  REM  DAY 4 STARTS
4010  REM    ************************************************************
4020  FOR I = 1 TO 3
4040  FOR J = 1 TO 5:XMPLR(DEX) =  ASC (E$(I)): GOSUB 6000: GOSUB 11000:
    DEX = DEX + 1: NEXT J
4045 DEX = 1
4050  NEXT I
4060 SUM = 30: GOSUB 15000:DEX = 1
4070 SUM = 270: GOSUB 17000:DEX = 1
4080  RETURN
5000  REM    DAY 5 STARTS
5010  REM      *******************************************************
5020  GOSUB 18000
```

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5030  RETURN
5500  REM   DAY 6 STARTS
5510  REM     ************************************************************
5520  GOSUB 18000
5530  RETURN
5999  REM  ***********************************************
6000  REM  THIS ROUTINE IS TO DISPLAY WHICH EXMPLR IS TO BE DONE
6001  HOME
6005 RNO = RNO + 1
6009  VTAB (1): HTAB (1)
6010  PRINT "    TRIAL NUMBER =";RNO;" (INCLUDING IMAGERY) "
6012 TMT = T(7) - T(2)
6013 ERR = 1200 - TMT: VTAB (6): HTAB (25)
6014  PRINT ERR;
6015  IF ERR >  = 0 THEN 6017
6016  IF ERR < 0 THEN 6018
6017  PRINT "  TOO FAST": GOTO 6020
6018  PRINT "  TOO SLOW": GOTO 6020
6020  VTAB (10): HTAB (25): PRINT "THE NEXT EXEMPLER IS ";
6022  IF  CHR$ (XMPLR(DEX)) <  > "A" THEN 6024
6023  PRINT "BLUE": GOTO 6030
6024  IF  CHR$ (XMPLR(DEX)) <  > "B" THEN 6026
6025  PRINT "WHITE": GOTO 6030
6026  IF  CHR$ (XMPLR(DEX)) <  > "C" THEN 6028
6027  PRINT "RED": GOTO 6030
6028  PRINT  CHR$ (XMPLR(DEX))
6030  VTAB (20): PRINT "TYPE ANY KEY TO CONTINUE"
6031  IF XMPLR(DEX) =  ASC ("A") OR XMPLR(DEX) =  ASC ("D") THEN DOP = 1

6032  IF XMPLR(DEX) =  ASC ("B") OR XMPLR(DEX) =  ASC ("E") THEN DOP = 2

6033  IF XMPLR(DEX) =  ASC ("C") OR XMPLR(DEX) =  ASC ("F") THEN DOP = 4

6034  IF XMPLR(DEX) =  ASC ("G") THEN DOP = 8
6036  POKE PO,DOP
6040  GET Z$
6045  POKE PO,0
6050  RETURN
7000  REM  *********************TO CALCULATE THE SWITCH TIMES*******
7010  REM  THIS ROUTINE CALL THE TIME ROUTINE WHENEVER THE TIME NEEDS
7020  REM  TO BE CALCULATED. IT WAITS FOR THE APPROPIATE BUTTONS TO BE
7030  REM  PRESSED AND THEN CALLS THE TIME ROUTINE
7040  REM  CALCULATE TIME 0
7200  REM  THIS CALCULATES THE TIMES BETWEEN BUTTONS
7210 REACTT(DEX) = T(2) - T(1)
7220 SEG(1,DEX) = T(3) - T(2)
7230 SWT(1,DEX) = T(4) - T(3)
7240 SEG(2,DEX) = T(5) - T(4)
7250 SWT(2,DEX) = T(6) - T(5)
7260 SEG(3,DEX) = T(7) - T(6)
7270  IF SEG(1,DEX) > 750 OR SEG(2,DEX) > 750 OR SEG(3,DEX) > 750 OR REA
    CTT(DEX) < 1 THEN QERR = 1:RNO = RNO - 1: PRINT "PERFORMING AGAIN
                         ": GET Z$: GOTO 7300
7275 TMT = T(7) - T(2): PRINT "ERROR = ";1200 - TMT
7280  PRINT "TRASH OUT LAST TRIAL (Y/N)": GET Z$
7290  IF Z$ = "Y" THEN QERR = 1:RNO = RNO - 1: PRINT "PERFORMING AGAIN
                         ": GET Z$
7300  RETURN
7999  REM  ***********************SAVE DATA************************
8000  REM  THIS ROUTINE IS TO FORMAT AND SAVE THE DATA
8010  HOME : HTAB (35): VTAB (10): PRINT "SAVING DATA"
8020  HTAB (34): VTAB (18): PRINT "PLEASE WAIT..."
8030  REM
8040  REM
8050  PRINT  CHR$ (4)
8060  PRINT  CHR$ (4);"OPEN";SNAME$;",D1"
8070  IF VADAY > 1 OR OPEN = 1 THEN  PRINT  CHR$ (4);"APPEND";SN$;",D1":
    GOTO 8100
8080  PRINT  CHR$ (4);"DELETE";SNAME$
8090  PRINT  CHR$ (4);"OPEN";SNAME$
8100  PRINT  CHR$ (4);"WRITE";SNAME$
8110 OPEN = 1
8200  FOR OSRI = 1 TO FINISHED
8210 PTRNO = PTRNO + 1
8220  FOR OOSRI = 1 TO 60:Q(OOSRI) = 32: NEXT OOSRI
8230 Q(1) =  ASC ( STR$ (DAY))
8250  ON  LEN ( STR$ (PTRNO)) GOSUB 8260,8270,8280: GOTO 8300
8260 Q(5) =  ASC ( STR$ (PTRNO)): RETURN
8270 Q(4) =  ASC ( STR$ ( INT (PTRNO / 10))):Q(5) =  ASC ( STR$ (PTRNO -
    INT (PTRNO / 10) * 10)): RETURN
```

```
8280 Q(3) =  ASC ( STR$ (PTRNO / 100)):Q(4) =  ASC ( STR$ ( INT (PTRNO /
     10) -  INT (PTRNO / 100) * 10)):Q(5) =  ASC ( STR$ (PTRNO -  INT (PT
     RNO / 10) * 10)): RETURN
8300  ON  LEN ( STR$ (ID)) GOSUB 8310,8320,8330: GOTO 8340
8310 Q(9) =  ASC ( STR$ (ID)): RETURN
8320 Q(8) =  ASC ( STR$ ( INT (ID / 10))):Q(9) =  ASC ( STR$ (ID -  INT
     (ID / 10) * 10)): RETURN
8330 Q(7) =  ASC ( STR$ (ID / 100)):Q(8) =  ASC ( STR$ ( INT (ID / 10) -
     INT (ID / 100) * 10)):Q(9) =  ASC ( STR$ (ID -  INT (ID / 10) * 10)
     ): RETURN
8340 Q(11) = XMPLR(OSRI)
8350 Q(13) =  ASC ( STR$ (TYPE))
8360 Q(15) =  ASC (SEX$)
8370 Q(17) =  ASC ( STR$ (MTYPE(OSRI)))
8400  IF REACTT(OSRI) < 0 THEN Q(19) =  ASC ("-")
8405  ON  LEN ( STR$ (REACTT(OSRI))) GOSUB 8410,8420,8430,8435: GOTO 844
     0
8410 Q(22) =  ASC ( STR$ (REACTT(OSRI))): RETURN
8420 Q(21) =  ASC ( STR$ ( INT (REACTT(OSRI) / 10))):Q(22) =  ASC ( STR$
     (REACTT(OSRI) -  INT (REACTT(OSRI) / 10) * 10)): RETURN
8430 Q(20) =  ASC ( STR$ (REACTT(OSRI) / 100)):Q(21) =  ASC ( STR$ ( INT
     (REACTT(OSRI) / 10) -  INT (REACTT(OSRI) / 100) * 10)):Q(22) =  ASC
     ( STR$ (REACTT(OSRI) -  INT (REACTT(OSRI) / 10) * 10)): RETURN
8435 Q(19) =  ASC ( STR$ ( INT (REACTT(OSRI) / 1000))):Q(20) =  ASC ( STR$
     ( INT (REACTT(OSRI) / 100) -  INT (REACTT(OSRI) / 1000) * 10)):Q(21)
      =  ASC ( STR$ ( INT (REACTT(OSRI) / 10) -  INT (REACTT(OSRI) / 1000
     ) * 100)):Q(22) =  ASC ( STR$ (REACTT(OSRI) -  INT (REACTT(OSRI) / 1
     0) * 10)): RETURN
8440  IF SEG(1,OSRI) < 0 THEN Q(24) =  ASC ("-")
8445  ON  LEN ( STR$ (SEG(1,OSRI))) GOSUB 8450,8460,8470: GOTO 8500
8450 Q(27) =  ASC ( STR$ (SEG(1,OSRI))): RETURN
8460 Q(26) =  ASC ( STR$ ( INT (SEG(1,OSRI) / 10))):Q(27) =  ASC ( STR$
     (SEG(1,OSRI) -  INT (SEG(1,OSRI) / 10) * 10)): RETURN
8470 Q(25) =  ASC ( STR$ (SEG(1,OSRI) / 100)):Q(26) =  ASC ( STR$ ( INT
     (SEG(1,OSRI) / 10) -  INT (SEG(1,OSRI) / 100) * 10)):Q(27) =  ASC ( STR$
     (SEG(1,OSRI) -  INT (SEG(1,OSRI) / 10) * 10)): RETURN
8500  IF SWT(1,OSRI) < 0 THEN Q(29) =  ASC ("-")
8505  ON  LEN ( STR$ (SWT(1,OSRI))) GOSUB 8510,8520,8530: GOTO 8550
8510 Q(32) =  ASC ( STR$ (SWT(1,OSRI))): RETURN
8520 Q(31) =  ASC ( STR$ ( INT (SWT(1,OSRI) / 10))):Q(32) =  ASC ( STR$
     (SWT(1,OSRI) -  INT (SWT(1,OSRI) / 10) * 10)): RETURN
8530 Q(30) =  ASC ( STR$ (SWT(1,OSRI) / 100)):Q(31) =  ASC ( STR$ ( INT
     (SWT(1,OSRI) / 10) -  INT (SWT(1,OSRI) / 100) * 10)):Q(32) =  ASC ( STR$
     (SWT(1,OSRI) -  INT (SWT(1,OSRI) / 10) * 10)): RETURN
8550  IF SEG(2,OSRI) < 0 THEN Q(34) =  ASC ("-")
8555  ON  LEN ( STR$ (SEG(2,OSRI))) GOSUB 8560,8570,8580: GOTO 8600
8560 Q(37) =  ASC ( STR$ (SEG(2,OSRI))): RETURN
8570 Q(36) =  ASC ( STR$ ( INT (SEG(2,OSRI) / 10))):Q(37) =  ASC ( STR$
     (SEG(2,OSRI) -  INT (SEG(2,OSRI) / 10) * 10)): RETURN
8580 Q(35) =  ASC ( STR$ (SEG(2,OSRI) / 100)):Q(36) =  ASC ( STR$ ( INT
     (SEG(2,OSRI) / 10) -  INT (SEG(2,OSRI) / 100) * 10)):Q(37) =  ASC ( STR$
     (SEG(2,OSRI) -  INT (SEG(2,OSRI) / 10) * 10)): RETURN
8600  IF SWT(2,OSRI) < 0 THEN Q(39) =  ASC ("-")
8605  ON  LEN ( STR$ (SWT(2,OSRI))) GOSUB 8610,8620,8630: GOTO 8650
8610 Q(42) =  ASC ( STR$ (SWT(2,OSRI))): RETURN
8620 Q(41) =  ASC ( STR$ ( INT (SWT(2,OSRI) / 10))):Q(42) =  ASC ( STR$
     (SWT(2,OSRI) -  INT (SWT(2,OSRI) / 10) * 10)): RETURN
8630 Q(40) =  ASC ( STR$ (SWT(2,OSRI) / 100)):Q(41) =  ASC ( STR$ ( INT
     (SWT(2,OSRI) / 10) -  INT (SWT(2,OSRI) / 100) * 10)):Q(42) =  ASC ( STR$
     (SWT(2,OSRI) -  INT (SWT(2,OSRI) / 10) * 10)): RETURN
8650  IF SEG(3,OSRI) < 0 THEN Q(44) =  ASC ("-")
8655  ON  LEN ( STR$ (SEG(3,OSRI))) GOSUB 8660,8670,8680: GOTO 8800
8660 Q(47) =  ASC ( STR$ (SEG(3,OSRI))): RETURN
8670 Q(46) =  ASC ( STR$ ( INT (SEG(3,OSRI) / 10))):Q(47) =  ASC ( STR$
     (SEG(3,OSRI) -  INT (SEG(3,OSRI) / 10) * 10)): RETURN
8680 Q(45) =  ASC ( STR$ (SEG(3,OSRI) / 100)):Q(46) =  ASC ( STR$ ( INT
     (SEG(3,OSRI) / 10) -  INT (SEG(3,OSRI) / 100) * 10)):Q(47) =  ASC ( STR$
     (SEG(3,OSRI) -  INT (SEG(3,OSRI) / 10) * 10)): RETURN
8800  FOR OOSRI = 1 TO 60: PRINT  CHR$ (Q(OOSRI));: NEXT OOSRI
8810  PRINT
8900  NEXT OSRI
8910  PRINT  CHR$ (4);"CLOSE";SNAME$
8920  HOME :A =  FRE (0): PRINT A: GET Z$
8930  PRINT : PRINT  CHR$ (4);"BLOAD FINAL": POKE 24576,0
8990  RETURN
9000  REM  ****************TIMER ROUTINE****************************
9004  POKE PO,0
9005  POKE 24576,0
9006  IF Y = 1 THEN  CALL 25088
9007  IF Y = 0 THEN  CALL 24960
9011  POKE 24578,0
9012  POKE 24577,0
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9013  POKE PO,0
9020  FOR ZO = 0 TO 6
9030 X1 =  PEEK (24586 + ZO * 5)
9040 X2 =  PEEK (24587 + ZO * 5)
9050 P2 = 1
9060 M0 = 0
9070 M2 = 0
9080  FOR Z1 = 1 TO 4
9090 M0 = P2 *  INT (X1 - ( INT (X1 / 2) * 2)) + M0
9100 M2 = P2 *  INT (X2 - ( INT (X2 / 2) * 2)) + M2
9110 P2 = P2 * 2
9120 X1 =  INT (X1 / 2):X2 =  INT (X2 / 2)
9130  NEXT Z1
9140 M1 = X1
9150 M3 = X2
9160 M4 = M3 +  PEEK (24588 + ZO * 5) * 16 +  PEEK (24589 + ZO * 5) * 40
    96 +  PEEK (24590 + ZO * 5) * 1048576
9170  IF ZO = 0 THEN M5 =  INT (M4 / 10000) * 10000
9180 T(ZO + 1) = (M4 - M5) * 1000 + M0 + M1 * 10 + M2 * 100
9190  NEXT ZO
9410  GOSUB 7000
9500  RETURN
10000  PRINT  CHR$ (4)
10010  PRINT  CHR$ (4);"IN#4"
10020  PRINT  CHR$ (4);"PR#4"
10030  INPUT " ";T$
10040  PRINT  CHR$ (4);"PR#0"
10045  PRINT  CHR$ (4);"PR#3"
10050  PRINT  CHR$ (4);"IN#0"
10060 H =  VAL ( MID$ (T$,7,2))
10070 M =  VAL ( MID$ (T$,10,2))
10080 S =  VAL ( MID$ (T$,13,2))
10090 MS =  VAL ( RIGHT$ (T$,3))
10100 TIME = H * 3600000 + M * 60000 + S * 1000 + MS
10110  RETURN
10500  GOSUB 10000:ITIME = TIME
10510  GOSUB 10000:ELTIME = TIME - ITIME: IF ELTIME < DLY THEN 10510
10520  RETURN
11000  REM   ************CONDITION 1****************************
11010  REM   CONDITION 1 - TONE ONLY FOR TIME SPECIFIED
11020  REM      THE INPUT  TO THIS ROUTINE IS TIME
11030  REM    FOR WHICH THE BUZZER IS TO BE KEPT ON
11040  REM   AND EXITS ONLY AFTER THE BUZZER'S ON TIME IS UP
11062  POKE PO,64:DLY = 50: GOSUB 10500: POKE PO,0
11063 DLY = 500: GOSUB 10500: POKE PO,128
11070 DLY = 1200: GOSUB 10500
11080  POKE PO,0
11090  RETURN
12000  REM   ************CONDITION 2***************************
12010  REM    CONDITION 2 - TONE WITH MOVEMENT
12011 PO = 49328
12014 DLY = 50: POKE PO,64: GOSUB 10500: POKE PO,0
12030 Y = 1: GOSUB 9000:Y = 0
12040  RETURN
13000  REM   ************CONDITION 3***************************
13005  REM  CONDITION 3 -RANDOM MOVEMENT WITH TONE
13006 DEX = 1:TSRI = 0
13010  FOR S33 = 1 TO 3:P(S33) = 0: NEXT S33
13020  FOR S33 = 1 TO SUM
13030 WHICH =  INT (( RND (1) * 3) + 1)
13035  IF P(WHICH) >  = (SUM / 3) THEN 13030
13040 P(WHICH) = P(WHICH) + 1
13045 MTYPE(DEX) = 3
13050 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 12000
13051  IF QERR = 1 THEN DEX = DEX - 1:TSRI = TSRI - 1:S33 = S33 - 1:P(WH
    ICH) = P(WHICH) - 1:QERR = 0
13055 DEX = DEX + 1
13056 TSRI = TSRI + 1
13057  IF TSRI >  = 30 THEN TSRI = 0:FINISHED = 30: GOSUB 21000: GOSUB 8
    000:FINISHED = 0:DEX = 1
13090  NEXT S33
13100  IF TSRI <  > 0 THEN FINISHED = TSRI: GOSUB 21000: GOSUB 8000:FINI
    SHED = 0:DEX = 1:TSRI = 0
13110  RETURN
14000  REM    ************CONDITION 4***************************
14010  REM    CONDITION 4 TONE THEN MOVEMENT
14030  GOSUB 11000
14040  GOSUB 9000
14050  RETURN
15000  REM    ************CONDITION 5***************************
15010  REM     CONDITION 5 RANDOM TONE THEN MOVEMENT
15015 DEX = 1
15020  FOR S55 = 1 TO 3:P(S55) = 0: NEXT S55
```

```
15025 TSRI = 0
15030  FOR S55 = 1 TO SUM
15040 WHICH =  INT (( RND (1) * 3) + 1)
15050  IF P(WHICH) >  = (SUM / 3) THEN 15040
15060 P(WHICH) = P(WHICH) + 1
15065 MTYPE(DEX) = 5
15066 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 14000
15067  IF QERR = 1 THEN DEX = DEX - 1:TSRI = TSRI - 1:S55 = S55 - 1:P(WH
    ICH) = P(WHICH) - 1:QERR = 0
15077 DEX = DEX + 1
15078 TSRI = TSRI + 1
15079  IF TSRI >  = 30 THEN TSRI = 0:FINISHED = 30: GOSUB 21000: GOSUB 8
    000:FINISHED = 0:DEX = 1
15090  NEXT S55
15100  IF TSRI <  > 0 THEN FINISHED = TSRI: GOSUB 21000: GOSUB 8000:FINI
    SHED = 0:DEX = 1:TSRI = 0
15110  RETURN
16000  REM     ************CONDITION 6***************************
16010  REM     CONDITION 6 -MOVEMENT ONLY
16020 DLY = 50: POKE PO,64: GOSUB 10500: POKE PO,0
16030  REM  START GETTING KEYS AS INPUTS
16040  REM  STORE DATA AT THE END OF EACH DAY
16045  GOSUB 9000
16050  RETURN
17000  REM     ************CONDITION 7***************************
17010  REM     CONDITION 7-RANDOM MOVEMENT ONLY
17011 TSRI = 0:DEX = 1
17020  FOR S77 = 1 TO 3:P(S77) = 0: NEXT S77
17030  FOR S77 = 1 TO SUM
17040 WHICH =  INT (( RND (1) * 3) + 1)
17050  IF P(WHICH) >  = (SUM / 3) THEN 17040
17060 P(WHICH) = P(WHICH) + 1
17061 MTYPE(DEX) = 7
17062 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 16000
17063  IF QERR = 1 THEN DEX = DEX - 1:S77 = S77 - 1:TSRI = TSRI - 1:QERR
     = 0:P(WHICH) = P(WHICH) - 1
17073 DEX = DEX + 1
17074 TSRI = TSRI + 1
17075  IF TSRI >  = 30 THEN TSRI = 0:FINISHED = 30: GOSUB 21000: GOSUB 8
    000:FINISHED = 0:DEX = 1
17090  NEXT S77
17100  IF TSRI <  > 0 THEN FINISHED = TSRI: GOSUB 21000: GOSUB 8000:FINI
    SHED = 0:DEX = 1:TSRI = 0
17110  RETURN
18000  REM     ************CONDITION 8***************************
18010  REM     CONDITION 8-RANDOM TRANSFER TRIALS
18011 TSRI = 0:DEX = 1:TYPE = 1:SUM = 8
18012 E$(1) = "D"
18013 E$(2) = "E"
18014 E$(3) = "F"
18015 E$(4) = "G"
18020  FOR S77 = 1 TO 4:P(S77) = 0: NEXT S77
18030  FOR S77 = 1 TO 8
18040 WHICH =  INT (( RND (3) * 4) + 1)
18050  IF P(WHICH) >  = (SUM / 4) THEN 18040
18060 P(WHICH) = P(WHICH) + 1
18061 MTYPE(DEX) = 8
18062 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 16000
18063  IF QERR = 1 THEN DEX = DEX - 1:TSRI = TSRI - 1:S77 = S77 - 1:P(WH
    ICH) = P(WHICH) - 1:QERR = 0
18073 DEX = DEX + 1
18074 TSRI = TSRI + 1
18090  NEXT S77
18100  REM  ********************************************************
18105  REM  REMAINING 40 TRIALS
18220  FOR S77 = 1 TO 4:P(S77) = 0: NEXT S77:SUM = 40
18230  FOR S77 = 1 TO 40
18240 WHICH =  INT (( RND (3) * 4) + 1)
18250  IF P(WHICH) >  = (SUM / 4) THEN 18240
18260 P(WHICH) = P(WHICH) + 1
18261 MTYPE(DEX) = 8
18262 XMPLR(DEX) =  ASC (E$(WHICH)): GOSUB 6000: GOSUB 16000
18263  IF QERR = 1 THEN DEX = DEX - 1:TSRI = TSRI - 1:S77 = S77 - 1:P(WH
    ICH) = P(WHICH) - 1:QERR = 0
18273 DEX = DEX + 1
18274 TSRI = TSRI + 1
18275  IF TSRI >  = 48 THEN TSRI = 0:FINISHED = 48: GOSUB 21000: GOSUB 8
    000:FINISHED = 0:DEX = 1
18290  NEXT S77
18300  IF TSRI <  > 0 THEN FINISHED = TSRI: GOSUB 21000: GOSUB 8000:FINI
    SHED = 0:DEX = 1:TSRI = 0
18310  RETURN
```

```
19999  REM  ***************TO PRINT THE PROMPT***********************
21000 TMT = T(7) - T(2)
21005  HOME
21010 ERR = 1200 - TMT: VTAB (6): HTAB (25)
21020  PRINT ERR;
21030  IF ERR >  = 0 THEN 21050
21040  IF ERR < 0 THEN 21060
21050  PRINT "  TOO FAST": GOTO 21065
21060  PRINT "  TOO SLOW"
21065  VTAB (20): HTAB (4): PRINT "PRESS ANY KEY TO CONTINUE SAVING DATA
     ": GET Z$
21070  RETURN
```

Appendix F

Cell Means and Standard Deviations

Table 4

Error Score Mean and Standard Deviations (in Msec) for Acquisition (Block 1-25) and Transfer (Block 26-29) for Experiment 1 (Task: A=Blue, B=White, C=Red, D=Green, E=Grey, F=Orange, G=Yellow)

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
1	1	1	A	12.938	112.138	143.596	35.3683
2	1	1	B	7.125	75.250	91.711	49.2443
3	1	1	C	74.167	95.167	94.063	71.2925
4	1	2	A	-22.263	90.158	102.087	43.5304
5	1	2	B	-41.143	79.000	83.508	45.7401
6	1	2	C	19.235	53.941	64.650	38.4862
7	1	3	A	34.736	33.643	104.941	59.1482
8	1	3	B	4.737	52.211	73.177	50.0118
9	1	3	C	21.382	43.941	60.940	40.9580
10	1	4	A	20.375	31.125	109.391	73.5607
11	1	4	B	-5.667	78.333	94.742	50.1304
12	1	4	C	42.375	66.125	64.802	38.5797
13	1	5	A	-3.353	29.588	35.071	19.5674
14	1	5	B	-29.367	39.400	41.404	30.7218
15	1	5	C	-27.279	33.944	35.941	29.3137
16	1	6	A	4.667	96.333	119.307	60.0285
17	1	6	B	-24.389	51.167	59.350	37.9446
18	1	6	C	-0.071	44.071	55.448	31.3503
19	1	7	A	0.235	57.059	72.119	41.7380
20	1	7	B	-13.462	39.462	130.168	92.0304
21	1	7	C	-14.309	41.709	45.443	23.2766
22	1	8	A	33.071	60.929	70.009	45.5213
23	1	8	B	-3.343	26.325	31.927	15.5942
24	1	8	C	-0.154	49.231	55.786	41.2576
25	1	9	A	12.500	39.900	50.373	32.0738
26	1	9	B	-3.688	56.188	75.963	50.5981
27	1	9	C	23.929	51.357	115.379	99.3715
28	1	10	A	-20.500	42.500	45.431	23.9029
29	1	10	B	-43.737	56.789	70.866	48.2961
30	1	10	C	20.706	47.882	80.943	57.5118
31	1	11	A	-49.474	63.263	56.192	39.3015
32	1	11	B	-45.412	57.118	47.966	33.5128
33	1	11	C	25.214	42.500	45.136	29.3464
34	1	12	A	-47.625	50.250	43.104	39.7987
35	1	12	B	-21.583	38.417	37.498	17.4223
36	1	12	C	13.136	40.955	45.987	26.3267
37	1	13	A	7.412	64.118	75.342	39.9373
38	1	13	B	-3.000	63.000	74.612	36.5461
39	1	13	C	-4.118	37.412	48.002	28.3987
40	1	14	A	-9.615	43.538	62.403	37.9728
41	1	14	B	-15.421	84.842	94.786	41.3391
42	1	14	C	6.722	27.056	34.762	22.2512
43	1	15	A	-35.933	57.800	67.345	43.0679
44	1	15	B	-34.000	52.824	59.121	41.9378
45	1	15	C	3.611	23.056	34.427	25.2225
46	1	16	A	-2.796	33.929	41.377	21.9246
47	1	16	B	-19.632	34.053	36.575	47.7103
48	1	16	C	8.941	29.529	36.740	22.5447
49	1	17	A	-19.500	48.500	61.576	41.4236
50	1	17	B	3.167	53.722	67.140	38.2435
51	1	17	C	5.786	44.929	54.979	29.7463
52	1	18	A	-35.667	50.813	61.380	36.2845
53	1	18	B	-21.900	43.300	59.542	44.5643
54	1	18	C	-21.895	38.421	44.411	30.3339
55	1	19	A	3.056	74.389	49.535	47.1070

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
56	1	19	B	-20.056	59.511	52.445	45.7424
57	1	19	C	-40.500	51.357	52.488	41.0002
58	1	20	A	-26.643	46.786	51.053	31.3366
59	1	20	B	7.375	30.500	40.656	25.3080
60	1	20	C	20.800	28.900	34.137	27.2318
61	1	21	A	5.600	57.733	74.952	45.5093
62	1	21	B	33.091	49.819	53.469	37.4975
63	1	21	C	17.000	30.077	35.435	24.2640
64	1	22	A	-29.511	49.722	53.686	34.5369
65	1	22	B	3.000	33.750	42.613	24.7076
66	1	22	C	37.938	41.313	33.547	28.2093
67	1	23	A	-1.190	49.286	65.463	41.5691
68	1	23	B	53.133	71.000	59.890	34.7933
69	1	23	C	63.286	63.286	32.090	32.0898
70	1	24	A	-73.786	76.071	40.305	35.4346
71	1	24	B	6.385	33.154	40.113	21.5052
72	1	24	C	27.087	29.087	25.134	22.5774
73	1	25	A	-31.900	41.100	44.149	35.2449
74	1	25	B	12.500	29.300	35.784	23.2653
75	1	25	C	22.850	32.850	30.877	19.1594
76	1	26	D	-14.300	42.500	50.969	28.5017
77	1	27	E	15.800	34.000	40.174	24.5351
78	1	28	F	33.100	41.900	44.431	35.2245
79	1	29	G	56.400	56.400	31.962	31.9625
80	2	1	A	-45.111	120.222	137.461	76.4411
81	2	1	B	-33.933	45.000	42.079	28.8914
82	2	1	C	11.118	40.294	56.195	39.5486
83	2	2	A	-13.294	42.118	54.879	36.2593
84	2	2	B	-25.105	53.474	61.067	37.3188
85	2	2	C	0.643	35.929	47.307	29.1243
86	2	3	A	23.308	61.154	82.229	57.4338
87	2	3	B	-22.722	37.167	42.247	29.4763
88	2	3	C	9.053	41.263	55.469	36.9607
89	2	4	A	-5.313	48.938	59.057	31.0365
90	2	4	B	-35.279	64.611	77.320	53.6274
91	2	4	C	-18.439	69.313	81.232	42.8575
92	2	5	A	19.870	51.522	54.111	41.3068
93	2	5	B	-5.545	41.364	45.593	17.9626
94	2	5	C	-3.750	41.750	59.673	41.4319
95	2	6	A	20.615	58.308	59.519	40.1277
96	2	6	B	-30.895	42.789	47.522	36.6433
97	2	6	C	-17.000	40.222	48.700	31.0589
98	2	7	A	1.395	39.368	46.935	23.8891
99	2	7	B	-13.533	29.133	41.156	31.3161
100	2	7	C	-1.813	38.313	56.285	40.0728
101	2	8	A	30.769	33.077	33.332	30.3449
102	2	8	B	-5.429	35.429	42.790	23.3229
103	2	8	C	11.188	29.313	39.656	27.5323
104	2	9	A	4.950	30.250	35.750	20.3260
105	2	9	B	-11.500	32.786	34.972	14.4178
106	2	9	C	-5.375	46.500	54.914	44.1679
107	2	10	A	4.450	27.850	41.388	30.2886
108	2	10	B	-8.632	34.842	48.140	33.3871
109	2	10	C	-38.182	44.909	42.696	34.7576
110	2	11	A	9.500	33.389	38.084	19.1193
111	2	11	B	4.778	41.2222	50.989	26.7188
112	2	11	C	32.143	33.7143	36.895	35.3519
113	2	12	A	-3.200	28.0000	33.875	15.9640
114	2	12	B	-85.615	85.6154	44.693	44.6925
115	2	12	C	-19.778	38.0000	39.274	21.1914
116	2	13	A	2.063	35.5625	51.228	35.7752
117	2	13	B	-24.294	43.8235	50.010	32.9777
118	2	13	C	5.176	24.9412	29.665	15.7340
119	2	14	A	-5.250	36.5833	41.469	17.0212
120	2	14	B	-12.435	38.6087	49.841	32.9762
121	2	14	C	23.000	40.2000	45.976	32.2805
122	2	15	A	15.750	34.3750	37.643	20.5228
123	2	15	B	-13.571	22.4286	28.069	21.2851
124	2	15	C	0.462	36.4615	46.948	27.6424
125	2	16	A	12.091	25.9091	30.828	20.0069
126	2	16	B	9.500	28.5000	35.813	24.3050
127	2	16	C	-1.900	43.3000	59.011	37.4583
128	2	17	A	2.053	20.3684	27.680	18.2398
129	2	17	B	14.263	39.5263	45.980	27.7976
130	2	17	C	-6.250	34.2500	48.415	33.2706
131	2	18	A	-3.357	17.2143	22.270	13.7459
132	2	18	B	10.600	21.4000	30.105	21.7784
133	2	18	C	-16.129	33.9355	41.337	28.0629
134	2	19	A	-13.647	42.1176	57.217	39.3354
135	2	19	B	8.250	47.3750	62.451	39.7322
136	2	19	C	11.882	33.0588	48.465	36.5744
137	2	20	A	-11.850	40.7500	52.629	34.2005
138	2	20	B	-1.167	34.5000	45.725	30.4037
139	2	20	C	11.000	24.1667	31.591	22.2009
140	2	21	A	-16.053	27.8421	32.869	23.1115
141	2	21	B	-17.111	37.1111	44.741	29.2150
142	2	21	C	19.385	26.9231	31.274	24.4931
143	2	22	A	-30.909	37.9091	33.222	24.4753
144	2	22	B	-15.417	31.0833	34.964	20.5814
145	2	22	C	24.438	29.3125	29.064	22.5410
146	2	23	A	-9.500	26.7222	34.752	23.3913
147	2	23	B	2.941	27.1765	35.689	22.3194
148	2	23	C	32.667	44.5333	45.190	33.9408
149	2	24	A	-25.750	25.7500	19.225	19.2246
150	2	24	B	-23.632	38.8947	41.401	26.5830
151	2	24	C	19.444	42.4815	49.749	31.5197
152	2	25	A	4.500	22.5000	29.479	18.9056
153	2	25	B	30.600	47.3000	51.834	36.2957
154	2	25	C	-3.550	35.6500	53.107	38.5758
155	2	26	D	11.500	19.5000	23.553	16.7083
156	2	27	E	27.200	30.0000	31.629	28.5783
157	2	28	F	74.300	74.3000	33.941	33.9413
158	2	29	G	83.300	83.3000	46.457	46.4568
159	3	1	A	-49.389	90.2778	111.839	80.3820
160	3	1	B	-30.857	73.4286	92.896	62.0369
161	3	1	C	19.833	72.8333	98.014	50.4594
162	3	2	A	-51.933	86.8667	84.644	44.3796
163	3	2	B	-29.500	59.0556	72.710	50.1544
164	3	2	C	16.882	67.0000	90.169	44.2761
165	3	3	A	5.119	63.2941	83.706	52.8202

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
166	3	3	B	33.000	85.300	96.848	51.5644
167	3	3	C	25.444	52.333	61.179	39.0957
168	3	4	A	-5.412	68.471	92.843	60.5776
169	3	4	B	36.625	101.625	116.048	62.3034
170	3	4	C	28.941	57.647	91.779	63.5150
171	3	5	A	-36.133	65.333	75.257	49.8908
172	3	5	B	-13.217	48.870	71.960	53.5175
173	3	5	C	-4.157	44.500	63.784	36.2529
174	3	6	A	-5.389	71.500	91.596	54.3423
175	3	6	B	-34.143	57.000	62.301	40.4703
176	3	6	C	2.778	30.889	42.650	28.5820
177	3	7	A	-42.313	59.563	73.483	59.3734
178	3	7	B	-25.071	49.214	65.682	48.8123
179	3	7	C	-20.800	41.800	55.094	40.6391
180	3	8	A	22.400	49.333	56.413	33.3524
181	3	8	B	18.952	54.476	69.407	45.5902
182	3	8	C	-3.143	39.571	62.813	33.3691
183	3	9	A	31.235	57.706	68.705	47.1060
184	3	9	B	-7.286	48.286	66.272	44.0252
185	3	9	C	-12.105	35.053	40.539	22.3867
186	3	10	A	23.000	63.857	83.563	56.2233
187	3	10	B	-0.208	57.208	66.927	32.5217
188	3	10	C	0.667	36.167	43.477	30.3909
189	3	11	A	73.200	90.600	106.178	90.0385
190	3	11	B	10.200	53.533	64.091	33.8903
191	3	11	C	16.880	39.360	50.690	35.3905
192	3	12	A	10.321	50.536	71.279	50.4260
193	3	12	B	-15.833	45.667	57.836	36.5540
194	3	12	C	5.900	23.900	29.501	16.9866
195	3	13	A	14.438	49.313	59.022	33.3481
196	3	13	B	13.706	56.882	69.143	39.2745
197	3	13	C	-14.882	39.706	53.583	37.8331
198	3	14	A	-2.053	54.895	65.150	32.5818
199	3	14	B	41.923	64.538	63.912	38.4244
200	3	14	C	5.500	39.833	48.889	27.2424
201	3	15	A	-0.250	35.375	42.278	21.2756
202	3	15	B	17.125	44.500	57.694	39.1050
203	3	15	C	27.222	46.667	60.005	31.2937
204	3	16	A	-18.316	47.789	56.665	33.9748
205	3	16	B	3.429	40.286	62.004	31.1335
206	3	16	C	11.118	31.000	34.181	16.5921
207	3	17	A	-5.824	42.647	60.812	26.1819
208	3	17	B	-33.333	48.722	49.007	33.1695
209	3	17	C	-23.333	41.857	45.666	28.1193
210	3	18	A	-30.917	47.417	43.620	30.8853
211	3	18	B	-15.200	48.600	60.700	38.3987
212	3	18	C	-17.111	40.222	47.664	29.4769
213	3	19	A	42.889	53.333	45.130	32.5172
214	3	19	B	40.167	48.944	49.729	40.5557
215	3	19	C	-23.714	46.571	61.914	45.8605
216	3	20	A	4.563	52.063	62.677	32.5484
217	3	20	B	-10.400	45.200	60.937	22.3354
218	3	20	C	-17.579	42.947	63.191	34.7634
219	3	21	A	27.522	58.217	68.824	44.5574
220	3	21	B	35.357	52.786	63.619	34.9377
221	3	21	C	-17.846	53.845	62.938	34.134
222	3	22	A	31.250	46.250	51.022	36.922
223	3	22	B	14.412	31.941	41.526	29.344
224	3	22	C	-20.706	30.588	31.786	21.720
225	3	23	A	29.933	53.533	64.203	28.765
226	3	23	B	6.250	35.850	45.446	27.452
227	3	23	C	-37.200	43.867	35.246	25.754
228	3	24	A	51.250	61.417	52.893	39.346
229	3	24	B	33.688	39.688	32.790	24.608
230	3	24	C	-32.136	41.864	36.151	23.511
231	3	25	A	60.000	79.700	94.666	77.876
232	3	25	B	-21.700	77.700	85.666	38.463
233	3	25	C	-3.200	57.500	76.313	48.520
234	3	26	D	15.200	39.400	45.700	26.697
235	3	27	E	-10.300	34.700	40.310	20.122
236	3	28	F	9.500	42.800	49.590	22.939
237	3	29	G	43.400	68.400	71.298	44.473
238	4	1	A	-31.000	61.737	73.716	49.247
239	4	1	B	58.200	106.867	137.795	101.870
240	4	1	C	73.198	76.563	88.155	85.043
241	4	2	A	-64.375	67.625	56.486	52.279
242	4	2	B	-20.750	59.350	65.102	31.364
243	4	2	C	39.286	54.429	63.451	49.978
244	4	3	A	14.733	55.000	65.888	36.506
245	4	3	B	17.400	38.200	54.104	41.087
246	4	3	C	21.900	42.100	49.048	32.324
247	4	4	A	-9.313	57.936	72.625	42.265
248	4	4	B	25.529	61.529	81.273	57.230
249	4	4	C	42.588	69.765	79.030	54.797
250	4	5	A	-30.368	49.526	49.024	28.066
251	4	5	B	9.125	50.000	64.791	40.249
252	4	5	C	20.933	36.400	37.820	21.915
253	4	6	A	1.600	40.667	51.813	30.255
254	4	6	B	-9.941	54.765	66.258	36.172
255	4	6	C	23.444	58.333	67.722	39.564
256	4	7	A	-54.650	58.950	38.493	31.105
257	4	7	B	15.588	49.353	63.245	40.867
258	4	7	C	56.385	72.231	73.996	57.162
259	4	8	A	-33.071	58.071	60.013	33.879
260	4	8	B	-2.071	31.500	47.031	33.882
261	4	8	C	49.955	61.955	66.624	55.062
262	4	9	A	-28.538	46.692	48.176	29.007
263	4	9	B	8.000	46.400	58.466	34.920
264	4	9	C	31.941	58.059	63.114	38.548
265	4	10	A	-53.389	57.056	56.883	52.980
266	4	10	B	-32.538	36.538	42.128	38.411
267	4	10	C	11.579	45.579	54.429	30.185
268	4	11	A	-46.267	66.667	62.499	37.917
269	4	11	B	-12.650	42.350	49.534	27.095
270	4	11	C	-21.867	38.000	39.306	22.586
271	4	12	A	-19.800	26.800	29.508	22.964
272	4	12	B	7.688	40.813	57.075	39.292
273	4	12	C	-5.857	44.571	58.140	35.746
274	4	13	A	-28.471	37.529	35.614	25.162
275	4	13	B	27.647	34.821	35.230	28.918

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
276	4	13	C	52.188	59.433	61.709	54.266
277	4	14	A	-3.389	35.056	40.759	19.295
278	4	14	B	16.923	35.077	38.630	21.670
279	4	14	C	20.737	49.474	57.045	33.532
280	4	15	A	3.444	29.778	37.808	23.772
281	4	15	B	32.750	45.000	44.868	30.002
282	4	15	C	-25.750	42.375	42.618	24.663
283	4	16	A	-4.944	27.611	31.616	14.773
284	4	16	B	29.643	49.071	48.252	26.102
285	4	16	C	-14.222	38.667	45.909	27.179
286	4	17	A	-10.600	29.000	40.203	28.906
287	4	17	B	7.395	30.737	38.365	23.247
288	4	17	C	12.813	31.938	37.226	21.745
289	4	18	A	-37.882	40.941	33.871	29.851
290	4	18	B	-21.789	28.632	28.460	21.114
291	4	18	C	-20.857	35.429	38.880	25.068
292	4	19	A	-11.071	39.214	49.512	30.453
293	4	19	B	14.889	40.333	49.716	31.367
294	4	19	C	-1.278	31.339	41.543	26.160
295	4	20	A	-58.700	59.000	34.609	34.068
296	4	20	B	-20.214	41.500	58.457	44.750
297	4	20	C	-22.438	41.063	42.925	24.104
298	4	21	A	-51.615	53.308	40.985	38.088
299	4	21	B	-43.071	49.500	47.702	40.430
300	4	21	C	-21.609	29.783	28.077	18.686
301	4	22	A	-9.824	30.176	40.901	29.424
302	4	22	B	-3.833	35.167	40.700	19.043
303	4	22	C	-23.000	28.500	39.326	35.171
304	4	23	A	-9.367	39.600	45.718	22.677
305	4	23	B	-0.350	47.650	62.937	39.638
306	4	23	C	-24.500	36.500	37.756	25.272
307	4	24	A	-23.381	38.048	39.473	24.742
308	4	24	B	22.000	38.750	38.695	20.296
309	4	24	C	-2.308	45.846	55.178	27.808
310	4	25	A	-37.800	38.700	29.199	27.931
311	4	25	B	42.000	49.800	43.776	34.097
312	4	25	C	-29.000	41.600	40.395	26.371
313	4	26	D	6.400	45.000	62.616	41.427
314	4	27	E	14.500	32.900	38.894	23.316
315	4	28	F	52.500	62.500	49.619	49.619
316	4	29	G	43.400	60.600	52.286	27.318
317	5	1	A	-20.875	81.500	100.605	59.171
318	5	1	B	5.421	58.211	75.707	48.484
319	5	1	C	75.600	180.133	384.781	345.564
320	5	2	A	-10.429	74.571	95.705	57.341
321	5	2	B	-22.198	50.313	60.344	38.293
322	5	2	C	14.500	41.000	53.102	35.661
323	5	3	A	63.526	128.368	201.734	166.019
324	5	3	B	-3.059	54.941	68.011	37.793
325	5	3	C	134.571	143.296	114.890	102.919
326	5	4	A	-39.889	52.444	53.462	46.800
327	5	4	B	-25.000	64.500	73.924	41.157
328	5	4	C	21.750	38.250	45.407	31.714
329	5	5	A	-30.533	83.200	106.348	69.944
330	5	5	B	-25.222	45.667	53.662	36.675
331	5	5	C	-10.412	38.1765	49.196	31.4150
332	5	6	A	-28.667	63.2222	70.068	39.3380
333	5	6	B	13.214	54.6429	76.531	53.1928
334	5	6	C	0.389	44.2778	53.372	27.8014
335	5	7	A	2.154	40.1538	49.452	26.5294
336	5	7	B	-20.750	45.9500	61.272	44.5521
337	5	7	C	1.118	60.0588	74.856	42.0988
338	5	8	A	-15.913	80.4348	94.444	49.1989
339	5	8	B	-27.308	83.5154	94.738	46.9992
340	5	8	C	-1.714	70.5714	101.495	70.2914
341	5	9	A	-24.188	52.4375	59.643	35.3308
342	5	9	B	-31.214	49.3571	55.668	39.0475
343	5	9	C	-19.200	34.0000	37.994	24.7939
344	5	10	A	-22.368	62.3684	71.379	38.9504
345	5	10	B	7.944	31.2778	41.414	27.3147
346	5	10	C	-15.538	41.0769	47.672	26.5752
347	5	11	A	-37.176	51.6471	53.959	39.1806
348	5	11	B	-44.286	49.1429	33.295	24.8963
349	5	11	C	15.211	35.1053	43.494	28.8981
350	5	12	A	-46.333	47.0000	35.965	35.0091
351	5	12	B	-15.571	41.8571	51.866	33.2420
352	5	12	C	23.471	50.4118	60.452	39.2366
353	5	13	A	-20.188	57.8125	78.317	40.7827
354	5	13	B	13.882	38.3529	57.653	44.3367
355	5	13	C	12.000	56.7059	85.351	63.4141
356	5	14	A	1.895	25.4737	31.728	18.0412
357	5	14	B	-18.778	31.1111	35.401	25.9522
358	5	14	C	8.538	41.7692	52.363	30.5100
359	5	15	A	-49.375	54.3750	47.554	40.7347
360	5	15	B	-13.667	37.3333	49.190	32.3146
361	5	15	C	15.313	23.9375	28.132	20.7444
362	5	16	A	-37.579	48.1053	52.884	42.9494
363	5	16	B	-5.529	27.0588	37.782	26.1163
364	5	16	C	14.714	33.8571	39.974	24.2609
365	5	17	A	-36.765	46.8824	43.448	31.4402
366	5	17	B	-19.800	31.4000	34.691	23.8142
367	5	17	C	35.500	39.2778	32.046	26.9789
368	5	18	A	-4.333	35.1667	47.594	30.5025
369	5	18	B	-30.000	38.6667	44.592	36.8558
370	5	18	C	25.300	26.7000	25.427	23.8727
371	5	19	A	-17.556	39.2222	56.383	43.3190
372	5	19	B	15.214	80.6429	128.699	99.0413
373	5	19	C	-0.500	48.1667	84.311	59.2058
374	5	20	A	-33.313	53.3125	62.362	45.1778
375	5	20	B	-8.400	31.9000	39.206	23.2422
376	5	20	C	-0.929	47.6429	55.394	25.0003
377	5	21	A	-17.545	50.4545	65.476	44.0765
378	5	21	B	-7.692	43.0769	57.880	37.4688
379	5	21	C	14.133	54.1333	63.725	33.5916
380	5	22	A	-67.882	69.8824	51.666	48.7505
381	5	22	B	-15.588	45.2353	50.407	24.9988
382	5	22	C	6.000	26.5000	32.993	19.4388
383	5	23	A	-14.400	35.2000	43.250	27.6617
384	5	23	B	-12.000	27.0000	31.496	19.0263
385	5	23	C	17.048	30.7619	39.293	29.2488

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
386	5	24	A	-25.000	45.333	45.211	25.1191
387	5	24	B	-24.455	32.455	30.953	21.9344
388	5	24	C	-5.588	24.938	31.910	19.7331
389	5	25	A	10.300	41.300	51.612	31.4812
390	5	25	B	44.350	60.750	53.670	32.5511
391	5	25	C	31.550	49.950	54.092	36.7072
392	5	26	D	132.200	132.200	60.077	60.0774
393	5	27	E	172.200	172.200	35.956	35.9561
394	5	28	F	168.400	168.400	52.282	52.2817
395	5	29	G	130.300	130.300	29.616	29.5162
396	6	1	A	-32.789	75.211	93.126	61.9387
397	6	1	B	-15.375	63.250	84.603	56.0577
398	6	1	C	101.133	112.200	88.171	72.4196
399	6	2	A	-78.875	90.250	77.404	62.7636
400	6	2	B	-68.133	71.733	68.005	53.1514
401	6	2	C	122.895	133.525	97.175	81.0270
402	6	3	A	-48.235	55.176	50.697	42.5150
403	6	3	B	-14.779	53.779	64.493	36.4475
404	6	3	C	85.600	105.733	101.025	77.9665
405	6	4	A	-47.471	96.059	99.841	50.5810
406	6	4	B	-36.706	76.941	85.987	50.3531
407	6	4	C	68.438	85.813	93.391	76.5709
408	6	5	A	-24.765	59.588	70.603	43.1713
409	6	5	B	-1.438	45.188	65.319	45.7241
410	6	5	C	49.176	58.000	68.250	48.8697
411	6	6	A	-13.000	48.000	70.004	51.0038
412	6	6	B	14.056	43.056	66.231	51.3115
413	6	6	C	37.778	56.000	68.488	39.8689
414	6	7	A	-35.700	78.400	81.319	38.5274
415	6	7	B	7.154	49.615	66.087	41.9057
416	6	7	C	13.647	58.176	74.842	48.7317
417	6	8	A	16.769	50.615	66.384	44.0010
418	6	8	B	2.478	45.793	62.002	40.7352
419	6	8	C	36.429	90.000	110.570	70.2260
420	6	9	A	19.714	57.000	77.536	54.1423
421	6	9	B	21.313	61.438	65.725	27.3950
422	6	9	C	36.350	68.350	81.184	55.7006
423	6	10	A	27.000	60.222	65.953	35.7994
424	6	10	B	-27.684	39.353	44.542	34.3971
425	6	10	C	66.539	66.692	60.928	60.7459
426	6	11	A	-2.567	37.067	51.252	34.0933
427	6	11	B	22.313	62.938	73.161	40.7226
428	6	11	C	29.053	71.263	89.349	59.2751
429	6	12	A	5.950	67.950	79.757	39.2193
430	6	12	B	24.000	62.000	83.631	58.7693
431	6	12	C	-1.647	55.529	67.225	35.2972
432	6	13	A	-22.294	75.235	84.889	41.4737
433	6	13	B	11.000	40.500	59.172	43.3682
434	6	13	C	-2.059	64.412	33.079	49.9851
435	6	14	A	-14.056	48.167	56.594	30.9121
436	6	14	B	23.263	49.474	55.541	32.7471
437	6	14	C	32.769	37.538	39.081	34.1189
438	6	15	A	-15.111	34.556	40.521	25.0511
439	6	15	B	39.375	53.875	57.076	42.5081
440	6	15	C	40.589	52.432	57.617	45.5861
441	6	16	A	-16.000	42.111	53.8953	36.0292
442	6	16	B	26.278	54.500	62.7214	38.9891
443	6	16	C	51.786	71.643	73.0871	51.9831
444	6	17	A	-9.600	57.333	72.0186	41.9943
445	6	17	B	43.765	50.235	40.7040	31.7894
446	6	17	C	-0.500	61.500	78.7836	46.9295
447	6	18	A	-58.119	60.705	47.6221	44.0579
448	6	18	B	12.846	57.000	69.6776	38.9102
449	6	18	C	-22.450	63.550	75.5697	44.5112
450	6	19	A	-29.000	55.571	56.9507	28.5939
451	6	19	B	21.333	65.333	88.2576	61.2517
452	6	19	C	-0.056	55.944	70.6403	40.9411
453	6	20	A	-23.850	54.650	62.6731	37.1870
454	6	20	B	23.688	45.563	52.0150	33.0110
455	6	20	C	36.786	64.795	79.7488	57.4204
456	6	21	A	-3.000	34.500	45.8813	28.5737
457	6	21	B	50.087	55.652	47.7045	40.7494
458	6	21	C	64.933	71.067	59.0187	50.8871
459	6	22	A	-47.118	71.118	80.1287	58.3576
460	6	22	B	0.125	25.375	31.0545	16.6608
461	6	22	C	62.176	65.235	54.3866	50.4363
462	6	23	A	-15.313	58.688	72.6211	43.4031
463	6	23	B	23.267	43.800	49.4924	31.2094
464	6	23	C	55.632	73.526	78.5191	61.0377
465	6	24	A	-44.333	52.048	43.0794	32.7894
466	6	24	B	-13.583	48.417	54.5552	24.9051
467	6	24	C	43.412	56.353	54.5264	40.0171
468	6	25	A	-28.100	46.800	48.9725	30.3967
469	6	25	B	25.150	57.650	69.5491	44.7711
470	6	25	C	42.550	76.550	82.3390	50.2609
471	6	26	D	88.900	93.900	65.3409	57.0428
472	6	27	E	82.100	82.100	50.0277	50.0277
473	6	28	F	134.900	134.900	39.7868	39.7868
474	6	29	G	156.100	156.100	75.1450	75.1450

Table 5

Relative Time Means and Standard Deviations for Acquisition (Block 1-25) and Transfer (Block 26-29) for Experiment 1 (RelT1= Relative Time, Segment 1, RelT2=Relative Time, Segment 2, RelT3= Relative Time, Segment 3; Task: A=Blue, B=White, C=Red, D=Green, E=Grey, F=Orange, G=Yellow)

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
1	1	1	A	32.6705	40.5660	26.7635	4.67819	4.79402	6.63778
2	1	1	B	28.3895	42.2298	29.3807	5.17207	8.68500	5.12261
3	1	1	C	32.3612	42.0029	25.6359	3.45811	4.47226	4.17127
4	1	2	A	29.2846	41.8972	28.8132	2.29618	4.21822	3.92427
5	1	2	B	25.7743	39.6901	34.5357	4.42505	7.65193	5.06312
6	1	2	C	31.3840	41.9859	26.6301	4.15280	4.65334	3.18259
7	1	3	A	28.6248	40.4368	30.9384	2.30103	3.77468	4.35643
8	1	3	B	26.2359	40.4141	33.3500	5.17247	5.83235	5.69001
9	1	3	C	29.0430	43.7722	27.1847	3.55854	3.11019	3.25299
10	1	4	A	29.7398	42.6196	27.6407	2.15010	2.03297	2.89408
11	1	4	B	25.2967	39.6421	35.0612	4.17785	5.34960	4.52075
12	1	4	C	31.3845	43.1487	25.4663	3.34248	2.92685	2.37206
13	1	5	A	29.3255	40.5376	30.1369	2.23991	2.94858	3.73659
14	1	5	B	25.9379	41.0844	32.9777	4.05267	6.65796	6.24214
15	1	5	C	29.2354	42.8462	27.9135	2.17404	2.84583	2.71791
16	1	6	A	29.9472	42.4229	27.6300	1.51924	1.43787	2.29159
17	1	6	B	27.5150	39.7572	32.6279	4.77662	6.39044	4.62851
18	1	6	C	29.5125	41.0252	29.4623	2.83314	2.84548	2.74680
19	1	7	A	29.7120	41.3295	28.9594	2.25724	2.75359	3.72938
20	1	7	B	26.0513	43.8332	30.1155	6.58467	4.72975	6.34971
21	1	7	C	28.8509	43.2866	27.8625	2.50265	3.64739	3.14435
22	1	8	A	29.2333	41.4774	29.2594	1.73761	3.15472	4.22518
23	1	8	B	25.4167	39.2272	35.3561	4.24127	5.42324	3.49535
24	1	8	C	28.4437	43.1353	28.4210	2.46957	2.55392	2.66197
25	1	9	A	30.2191	41.2181	28.5629	2.75745	2.55080	1.80745
26	1	9	B	26.8008	38.1995	34.9997	5.06762	4.74825	5.21760
27	1	9	C	27.2306	41.1362	31.6331	2.50298	3.42323	4.14214
28	1	10	A	30.1519	40.7617	29.0864	1.84461	1.87696	2.44299
29	1	10	B	27.8384	38.2732	33.8884	4.57491	6.23031	4.94593
30	1	10	C	25.8719	40.5386	33.5895	1.95262	3.04885	3.78478
31	1	11	A	30.9596	39.4756	29.5643	1.75264	3.03337	2.70563
32	1	11	B	27.0899	36.8072	36.1027	4.43497	5.69875	3.24826
33	1	11	C	28.6490	39.6724	31.6796	1.96369	2.13540	2.08051
34	1	12	A	31.5293	38.9529	29.5179	1.48758	2.67717	2.37639
35	1	12	B	28.8071	35.8824	35.3105	3.88247	3.03335	1.78981
36	1	12	C	28.1779	40.6348	31.1873	2.03912	3.05535	2.74352
37	1	13	A	30.5693	41.0659	28.3648	2.32150	2.39045	2.53630
38	1	13	B	28.7616	39.3507	31.8877	3.81272	5.58528	5.11924
39	1	13	C	27.7382	41.6159	30.6458	2.75039	3.03041	2.16656
40	1	14	A	29.6577	40.0129	30.3293	2.65074	1.69579	3.27165
41	1	14	B	27.7154	37.6459	34.6387	4.62979	5.43317	3.15531
42	1	14	C	28.6021	40.1728	31.2251	2.78905	3.22897	2.02468
43	1	15	A	27.8354	39.9882	32.1754	2.55896	3.13872	2.90562
44	1	15	B	28.3584	36.8854	34.7561	1.72464	3.77881	4.17865
45	1	15	C	27.3158	41.0772	31.1070	3.02866	2.76689	3.59924
46	1	16	A	29.4883	38.0579	32.4538	1.62072	1.66517	1.56579
47	1	16	B	29.0704	37.0439	33.8807	2.14999	3.47653	3.34979
48	1	16	C	27.8711	41.7194	30.4095	2.27610	1.97768	1.92442
49	1	17	A	29.1597	38.0104	32.8298	1.69857	1.40428	1.77911
50	1	17	B	28.5326	35.4968	35.9706	2.25212	2.31720	2.89799
51	1	17	C	28.3685	39.8481	31.7834	2.14643	2.81977	2.52554
52	1	18	A	29.7225	37.9085	32.3690	2.36022	2.16453	1.95907
53	1	18	B	29.3672	36.2917	34.3411	2.09834	3.06438	2.17293
54	1	19	C	27.4902	40.5791	31.9318	1.41102	2.03889	2.08466
55	1	19	A	29.3991	38.0974	32.5035	2.28551	2.49606	1.41709

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
56	1	19	B	28.9222	37.0151	34.0627	2.79696	4.15864	3.54366
57	1	19	C	28.0557	39.4396	32.5047	2.06894	3.70635	2.77012
58	1	20	A	27.0664	39.2740	33.6596	2.06163	2.42160	2.04784
59	1	20	B	27.2517	35.5627	37.1856	2.64437	2.32480	4.34225
60	1	20	C	27.5553	39.5162	32.9285	1.22603	2.70956	2.37776
61	1	21	A	28.5633	37.0770	34.3596	1.73584	2.11783	2.13740
62	1	21	B	30.1057	36.1912	33.7032	1.42182	1.80060	1.78175
63	1	21	C	27.2153	39.8796	32.9051	1.45793	2.54225	2.31017
64	1	22	A	28.7824	37.2161	34.0015	2.02032	2.39890	2.14292
65	1	22	B	29.5669	35.4338	34.9993	1.50899	2.47877	2.07464
66	1	22	C	27.8414	39.8084	32.3502	1.81364	1.80403	2.05911
67	1	23	A	29.5759	36.2785	34.0455	1.83906	1.80425	1.99473
68	1	23	B	29.8737	36.3810	33.7453	1.32712	1.84480	1.65706
69	1	23	C	28.3789	39.4879	32.1331	1.73343	2.61318	1.96514
70	1	24	A	28.6074	38.3950	32.9976	1.85817	2.29691	2.06819
71	1	24	B	28.9993	36.3407	34.6600	1.37714	1.35133	1.53351
72	1	24	C	28.2698	38.3658	33.3644	2.04468	2.22703	1.88396
73	1	25	A	28.4197	37.1199	34.4604	1.74668	1.59930	1.53494
74	1	25	B	28.9378	35.7140	35.3482	1.46582	1.40927	2.10345
75	1	25	C	26.6550	38.9788	34.3662	1.02035	1.89184	1.81329
76	1	26	D	27.3044	37.5520	35.1436	1.38513	2.59247	2.96687
77	1	27	E	28.0336	38.8385	33.1280	2.25923	2.47155	1.26845
78	1	28	F	27.2100	39.6726	33.1174	1.83853	1.59815	1.46546
79	1	29	G	27.4954	38.1969	34.3077	1.64452	2.11918	1.45244
80	2	1	A	29.2856	38.9163	31.7981	5.56816	3.55145	4.38018
81	2	1	B	32.9674	31.6494	35.3832	3.16542	4.45696	3.44667
82	2	1	C	29.5048	41.2782	29.2171	3.96181	5.04672	3.37394
83	2	2	A	31.5924	36.7742	31.6334	2.42298	3.03230	2.26725
84	2	2	B	31.7720	34.6256	33.6024	3.91464	4.55347	2.78886
85	2	2	C	32.4854	38.0806	29.4340	1.92973	2.65769	2.59070
86	2	3	A	28.8438	38.9155	32.2408	1.58505	3.33221	3.24633
87	2	3	B	28.9715	37.3269	33.7016	3.55593	5.34359	3.61788
88	2	3	C	30.5070	37.3366	32.1564	2.93445	4.78436	3.73356
89	2	4	A	27.6582	39.8242	32.5175	1.73755	2.30052	2.45914
90	2	4	B	30.1920	37.0093	32.7988	3.98918	6.59893	5.11495
91	2	4	C	29.8174	39.8300	30.3526	2.80880	5.49153	6.05996
92	2	5	A	27.6578	38.3108	34.0314	1.60755	3.82744	4.00435
93	2	5	B	28.7763	33.8460	37.3778	2.91313	5.43491	5.29516
94	2	5	C	30.5055	41.3723	28.1222	3.02730	3.25057	3.19245
95	2	6	A	28.4671	37.9809	33.5520	1.43700	4.60357	4.40382
96	2	6	B	27.3730	37.1145	35.5125	3.82155	5.31249	4.65422
97	2	6	C	28.3455	42.4694	29.1850	3.29216	4.14343	3.60700
98	2	7	A	30.9014	38.1131	30.9855	2.48156	2.52423	2.86298
99	2	7	B	31.5886	33.8513	34.5601	2.84114	3.56189	2.95967
100	2	7	C	30.9145	41.1750	27.9106	3.42615	3.33277	3.01734
101	2	8	A	29.2170	39.0200	31.7630	1.93815	3.93349	3.09228
102	2	8	B	30.2466	36.8709	32.8825	3.59329	6.54024	5.30001
103	2	8	C	30.9113	39.8269	29.2618	2.47288	3.76310	2.60937
104	2	9	A	28.3821	38.0706	33.5473	1.96052	3.80032	4.26420
105	2	9	B	28.1354	37.2466	34.6179	4.71217	4.74036	4.87231
106	2	9	C	30.0508	40.9930	28.9562	4.23481	3.91833	3.66378
107	2	10	A	29.1218	39.9791	30.8991	1.90511	1.04305	2.19733
108	2	10	B	28.6661	36.7316	34.6023	4.40126	4.79065	6.62872
109	2	10	C	29.3330	40.4610	30.2059	3.20756	4.45721	3.60401
110	2	11	A	29.4463	39.5917	30.9619	0.96215	4.07765	4.10414
111	2	11	B	30.1928	34.6779	35.1292	3.31371	7.13202	6.09720
112	2	11	C	28.1534	43.7511	28.0955	4.31659	6.42587	3.43442
113	2	12	A	28.7651	41.5721	29.6628	0.87808	1.29039	1.51819
114	2	12	B	27.4359	34.6623	37.9017	5.33301	6.22471	3.53161
115	2	12	C	29.4137	42.3244	28.2568	3.01298	3.78082	2.92447
116	2	13	A	29.6600	38.8222	31.5179	1.91015	3.82524	3.22158
117	2	13	B	30.9795	37.4686	31.5519	2.08944	5.61032	5.27315
118	2	13	C	30.2309	40.3763	29.3928	2.30417	4.53613	3.83688
119	2	14	A	27.4514	41.8927	30.6559	4.27876	4.15793	2.09804
120	2	14	B	26.4416	37.8946	35.6637	5.41473	7.45312	5.04982
121	2	14	C	26.9234	45.4233	27.6533	4.92902	5.38764	2.45345
122	2	15	A	28.0792	40.8527	31.0682	1.28372	3.42096	3.56802
123	2	15	B	25.9802	39.5165	34.5033	5.24624	8.70521	6.94518
124	2	15	C	26.3903	45.3152	28.2945	5.23332	7.11125	4.62826
125	2	16	A	29.1527	40.7892	30.0581	1.13508	2.61429	2.82661
126	2	16	B	27.2478	41.4838	31.2684	5.36587	7.34975	6.10301
127	2	16	C	28.9989	44.0658	26.9353	3.66193	5.02031	3.97539
128	2	17	A	27.8058	40.6393	31.5549	1.22575	4.36479	4.33397
129	2	17	B	28.5907	38.9952	32.4141	4.86251	7.81867	6.55854
130	2	17	C	29.0219	43.5644	27.4137	4.48832	5.40677	3.32403
131	2	18	A	28.8942	39.6748	31.4311	1.04084	4.48124	4.30936
132	2	18	B	29.7151	35.2562	35.0287	1.18787	6.70969	6.78018
133	2	18	C	28.6671	42.9361	28.3968	3.38286	4.83348	3.16175
134	2	19	A	28.1310	41.5907	30.2783	1.30815	1.81139	1.91672
135	2	19	B	26.0317	38.2214	35.7470	5.56291	6.78199	5.60800
136	2	19	C	29.1284	43.2344	27.6372	4.70374	6.41109	2.90972
137	2	20	A	29.4473	40.3239	31.2258	1.60989	4.09992	3.89613
138	2	20	B	28.1531	39.2739	32.5730	5.55507	6.01700	5.76871
139	2	20	C	30.5794	41.8377	27.5828	2.27137	1.62868	2.35318
140	2	21	A	28.3485	41.7598	29.8917	1.35879	1.28951	1.54312
141	2	21	B	29.4745	36.2509	34.2745	3.77120	7.32593	6.26383
142	2	21	C	30.1600	41.6829	28.1571	3.68374	4.13374	3.03234
143	2	22	A	27.6764	42.5001	29.8235	3.47387	4.22899	2.88607
144	2	22	B	27.9659	39.3472	32.6868	4.50114	9.13352	5.58219
145	2	22	C	30.7881	41.1084	28.1035	3.00112	4.25050	2.99508
146	2	23	A	28.8474	41.5572	29.5954	1.21488	1.65099	1.85670
147	2	23	B	29.2183	38.7433	32.0383	4.47958	7.75845	5.29351
148	2	23	C	30.8769	40.1223	29.0007	3.40484	4.27150	3.69474
149	2	24	A	29.1213	42.4960	28.3827	1.31675	1.40863	0.54021
150	2	24	B	26.7184	40.4526	32.8290	6.01664	6.43661	5.63590
151	2	24	C	30.5688	41.3399	28.0913	3.37092	3.90416	3.73612
152	2	25	A	28.4842	40.2169	31.2989	1.30943	4.19336	4.42446
153	2	25	B	28.1024	35.6299	36.2678	4.06560	5.59242	5.87742
154	2	25	C	29.9766	41.8063	28.2171	3.15155	3.35735	2.96293
155	2	26	D	24.8316	42.8526	32.3158	6.14981	8.56992	6.48900
156	2	27	E	27.9067	43.7479	28.3455	3.92162	4.25246	2.14572
157	2	28	F	30.3350	42.7148	26.9502	2.61477	2.17879	2.03472
158	2	29	G	30.6930	41.5402	27.7669	1.79227	4.08278	4.13662
159	3	1	A	25.5434	39.5913	34.8653	3.41602	4.95786	5.08261
160	3	1	B	27.1154	36.9148	35.9697	2.75782	4.02802	3.83354
161	3	1	C	30.3910	41.1770	28.4320	3.04843	3.34580	3.68778
162	3	2	A	27.4599	38.1785	34.3617	7.66881	7.55604	6.50061
163	3	2	B	27.6321	38.5459	33.8220	3.30079	4.94883	5.38884
164	3	2	C	32.0171	43.6417	24.3412	3.33550	3.05016	4.08613
165	3	3	A	29.1495	34.9326	35.9179	3.07272	3.68833	4.67171

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
166	3	3	B	25.9375	38.0228	36.0398	2.62102	4.32529	5.28541
167	3	3	C	31.6597	43.9172	24.4231	1.94501	3.95369	4.40709
168	3	4	A	27.5835	34.8809	37.5355	3.67641	4.34178	6.07376
169	3	4	B	27.2821	38.3732	34.3447	3.77184	5.41187	5.45909
170	3	4	C	31.5415	45.1629	23.2955	1.55334	4.15414	4.45158
171	3	5	A	28.4299	36.6399	34.9302	3.12832	3.98077	4.17944
172	3	5	B	29.1787	38.5474	32.2739	2.51058	2.91918	3.86207
173	3	5	C	31.9270	44.5586	23.5144	1.82525	2.51184	2.74037
174	3	6	A	29.3842	34.8403	35.7755	2.48366	2.77919	4.00380
175	3	6	B	28.2396	38.4918	33.2686	2.50149	3.91357	3.80014
176	3	6	C	32.8063	43.8438	23.3499	1.64413	2.35290	2.06998
177	3	7	A	25.9729	37.0749	36.9522	2.00562	3.84107	3.31451
178	3	7	B	25.6437	39.1463	35.2100	2.19116	2.60215	3.42052
179	3	7	C	32.0594	45.3055	22.6350	2.75093	2.25041	1.94514
180	3	8	A	25.1940	35.5410	39.2650	2.67962	3.54128	3.19652
181	3	8	B	26.1086	37.1782	36.7132	2.21179	3.22837	2.88272
182	3	8	C	31.7482	45.7370	22.5148	1.19841	1.53727	1.84630
183	3	9	A	26.3886	35.4584	38.1530	3.61039	3.25968	3.52541
184	3	9	B	27.0774	37.5300	35.3927	1.88517	2.65904	3.04840
185	3	9	C	31.4335	46.2295	22.3370	1.91056	2.68121	2.85737
186	3	10	A	26.5981	35.3041	38.0978	2.08876	3.32598	4.77574
187	3	10	B	26.6277	37.1093	36.2630	2.44849	2.61886	3.75971
188	3	10	C	31.2208	48.3631	20.4161	2.05498	2.88192	2.42920
189	3	11	A	27.3625	34.6956	37.9419	2.51798	3.14509	3.97366
190	3	11	B	27.0309	36.7003	36.2688	1.89745	3.19987	3.74217
191	3	11	C	31.3914	47.0656	21.5430	1.67565	2.42098	1.96982
192	3	12	A	29.5478	33.9371	36.5150	2.62026	2.33979	3.04999
193	3	12	B	28.8877	36.1852	34.9271	1.85849	3.42228	3.95117
194	3	12	C	32.9460	46.0026	21.0514	1.92445	3.13902	2.18363
195	3	13	A	27.0210	36.2470	36.7321	2.46195	3.11133	3.27961
196	3	13	B	27.3040	37.5120	35.1840	2.03593	2.09210	2.23319
197	3	13	C	31.7932	46.7316	21.4753	2.59785	2.46430	1.97446
198	3	14	A	26.9653	35.6738	37.3609	3.02268	2.64625	3.30829
199	3	14	B	28.7841	35.6618	35.5541	1.83040	2.07640	1.54350
200	3	14	C	32.0326	45.9637	22.0035	2.39433	2.80557	4.18593
201	3	15	A	27.9734	36.9597	35.0669	2.10442	2.36000	3.04931
202	3	15	B	28.0918	36.2179	35.6903	2.12086	1.67509	2.75182
203	3	15	C	32.1743	47.5231	20.3025	1.33513	2.17007	1.13274
204	3	16	A	27.7552	35.4597	36.7850	2.85312	3.27564	2.50705
205	3	16	B	28.8286	36.1149	35.0564	2.13451	2.16985	2.99249
206	3	16	C	31.8343	48.4353	19.7305	1.71757	1.95297	1.04218
207	3	17	A	27.2112	35.8352	36.9536	2.37281	2.40389	2.78082
208	3	17	B	27.3867	36.8906	35.7227	1.24443	1.91911	2.01174
209	3	17	C	30.8913	49.9936	19.1151	2.33447	2.54673	0.96744
210	3	18	A	26.5676	35.7117	37.7207	1.67244	2.34324	2.44057
211	3	18	B	27.2083	36.9773	35.8143	1.56688	2.20192	2.32326
212	3	18	C	31.3515	49.3678	19.2807	1.64214	1.71038	1.32142
213	3	19	A	29.3444	33.8099	36.8456	1.72527	1.88004	2.72836
214	3	19	B	28.7287	36.2028	35.0685	1.58150	2.62392	2.11908
215	3	19	C	31.1323	49.4612	19.4064	2.42724	2.29095	1.26166
216	3	20	A	31.1381	33.9017	34.9601	2.76332	2.22820	3.10633
217	3	20	B	29.4700	35.0679	35.4620	2.07692	1.96493	2.82867
218	3	20	C	31.9306	49.4298	18.6396	1.70619	2.33230	1.33829
219	3	21	A	29.2637	35.4763	35.2600	2.25361	2.13470	2.23954
220	3	21	B	26.9671	35.7746	35.2583	2.01101	1.74538	1.80180
221	3	21	C	31.0613	50.2813	18.6573	1.80156	1.59210	1.79719
222	3	22	A	27.6292	35.7061	36.6647	2.49037	2.67785	2.82910
223	3	22	B	27.5117	36.9975	35.3907	1.82449	2.17469	2.24888
224	3	22	C	31.5421	50.5456	17.9123	1.86159	1.89393	1.40073
225	3	23	A	28.3803	34.3469	37.2728	1.64100	2.00289	2.04922
226	3	23	B	26.6736	37.6738	35.6525	1.59900	2.35825	2.18393
227	3	23	C	30.9822	51.1041	17.9137	1.17266	1.39733	1.14985
228	3	24	A	27.2310	35.3291	37.4399	1.44809	1.44202	1.88523
229	3	24	B	26.0063	36.8123	37.1813	1.42999	2.06360	1.97651
230	3	24	C	29.1686	52.1520	18.6793	1.24917	2.43332	1.69942
231	3	25	A	29.4720	33.6232	36.9048	2.22437	1.67301	2.41094
232	3	25	B	27.1216	36.7132	36.1652	2.29321	2.71909	2.47556
233	3	25	C	30.1827	51.6124	18.2049	2.18853	2.12752	1.23281
234	3	26	D	28.5398	35.7356	35.7246	1.81411	1.85631	2.41810
235	3	27	E	26.4098	39.5345	34.0557	1.84270	2.26784	1.52687
236	3	28	F	26.8657	54.4907	18.6436	1.22160	1.45010	1.54749
237	3	29	G	28.6000	52.1192	19.2808	1.21241	2.25182	1.90243
238	4	1	A	33.7789	37.9687	28.2524	2.81576	3.15193	4.36993
239	4	1	B	32.1413	39.5438	28.3140	3.96639	4.59418	5.23888
240	4	1	C	33.0661	44.5277	22.4052	3.50819	5.45214	2.86328
241	4	2	A	31.9421	39.4665	28.5914	2.12650	3.74214	3.45086
242	4	2	B	29.6881	40.9210	29.3909	4.04590	5.44967	4.71417
243	4	2	C	32.9585	45.7744	21.2671	4.16956	4.33354	3.19791
244	4	3	A	30.6591	39.5547	29.7862	2.09031	4.03724	3.98957
245	4	3	B	29.2656	41.1088	29.6256	3.36354	5.61730	5.11548
246	4	3	C	31.1773	46.8224	22.0003	3.52570	3.79640	1.48333
247	4	4	A	30.9122	40.8348	28.2530	2.55043	3.35252	4.37739
248	4	4	B	29.9891	41.0533	28.9575	3.28277	6.52108	4.21964
249	4	4	C	32.4550	44.7996	22.7454	3.29618	3.38522	2.54476
250	4	5	A	30.3864	40.1910	29.4225	2.93252	4.55057	4.55961
251	4	5	B	30.6019	39.4260	29.9721	2.59414	4.15133	4.52069
252	4	5	C	30.4011	46.2725	23.3254	1.97432	3.17724	2.56297
253	4	6	A	30.7985	38.7261	30.4854	2.02439	2.98582	3.35160
254	4	6	B	28.3404	38.2159	33.4437	3.71730	5.17464	4.06982
255	4	6	C	31.1951	44.3534	24.4515	2.45887	2.77597	3.28257
256	4	7	A	30.0764	38.8652	31.0584	1.22515	5.48712	5.58639
257	4	7	B	29.3370	38.6285	32.0345	3.08487	6.51973	5.63441
258	4	7	C	31.7217	43.9648	24.3134	1.93755	2.42671	2.59932
259	4	8	A	29.5620	40.9208	29.5172	1.51564	3.22834	2.94805
260	4	8	B	28.6445	40.1784	31.1771	3.89781	6.58250	4.92515
261	4	8	C	29.9067	45.1375	24.9558	2.74768	3.14297	2.76802
262	4	9	A	29.7370	40.6106	29.6525	1.80961	3.20617	2.91102
263	4	9	B	26.5449	40.7311	32.6241	3.30864	5.95342	4.62862
264	4	9	C	29.0033	43.1371	27.8596	2.58816	3.72539	3.47024
265	4	10	A	30.0050	40.5112	29.4838	1.72772	1.71790	2.23000
266	4	10	B	26.7290	41.3666	31.9044	5.16300	7.09501	3.41592
267	4	10	C	29.9315	46.1294	23.9391	2.42106	2.07861	1.57131
268	4	11	A	28.7830	39.1701	32.0469	2.13151	3.49880	4.44422
269	4	11	B	28.5877	41.0749	30.3374	2.96785	4.73694	3.13797
270	4	11	C	30.8023	46.4514	22.7463	2.02752	1.51247	1.51384
271	4	12	A	27.8703	41.0306	31.0991	3.52135	5.35038	3.77707
272	4	12	B	29.8211	39.3835	31.0953	3.48172	5.84065	6.08316
273	4	12	C	30.4655	46.1450	23.3895	1.31385	2.27719	1.97389
274	4	13	A	29.7835	39.0855	31.1310	2.67603	5.39354	4.39476
275	4	13	B	30.3363	38.4059	31.2579	2.33768	4.59913	3.90564

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
276	4	13	C	30.4306	43.6143	25.9551	2.33409	2.60514	1.92760
277	4	14	A	30.5650	38.8072	30.6278	1.07039	2.33792	2.12836
278	4	14	B	27.2538	42.5999	30.1462	4.14258	4.56533	3.10763
279	4	14	C	31.4599	43.8586	24.6815	1.73047	2.53988	2.69503
280	4	15	A	29.2597	39.5252	31.2152	3.12291	5.33731	3.74763
281	4	15	B	29.3296	37.9937	32.6767	2.77275	3.82079	4.08743
282	4	15	C	32.4501	43.9471	23.6029	1.60851	2.06596	2.05528
283	4	16	A	30.6684	38.9147	30.4169	1.30137	2.87748	2.80808
284	4	16	B	29.7625	37.4891	32.7484	2.42125	4.60829	3.25716
285	4	16	C	31.9298	45.0865	22.9837	1.23745	1.99137	1.45670
286	4	17	A	30.5629	38.2090	31.2282	1.14022	3.97812	3.87144
287	4	17	B	30.2162	38.6343	31.1495	1.51443	2.91385	2.76654
288	4	17	C	32.7010	44.8522	22.4468	1.49780	1.80333	1.17985
289	4	18	A	30.9274	38.1874	30.8852	1.27845	3.90886	3.89653
290	4	18	B	30.8264	38.8761	30.2975	1.46406	3.31043	3.28208
291	4	18	C	31.8939	45.9124	22.1937	1.55251	1.87955	1.64268
292	4	19	A	29.6579	38.7312	31.6109	0.87963	2.29363	2.78160
293	4	19	B	29.4348	40.6585	29.9065	3.42248	5.13473	3.14970
294	4	19	C	31.8808	45.1374	22.9819	1.93030	2.94117	1.91101
295	4	20	A	29.6424	40.4315	29.9261	2.51714	1.95188	3.35247
296	4	20	B	30.6933	39.8330	29.4737	1.81695	2.61677	3.45376
297	4	20	C	31.5520	46.8629	21.5851	1.60360	1.91306	1.72967
298	4	21	A	30.2041	39.0631	30.7328	1.31064	3.53498	3.11828
299	4	21	B	30.5304	41.1339	28.3357	1.25680	2.62265	2.93216
300	4	21	C	30.8463	46.5803	22.5734	1.71093	1.65871	2.11737
301	4	22	A	29.5803	38.0560	32.3637	1.34212	3.40256	3.63674
302	4	22	B	29.7871	41.3950	28.8179	2.60684	3.47501	2.82128
303	4	22	C	30.7353	47.7694	21.4952	1.73598	2.46717	2.26364
304	4	23	A	29.8694	38.8903	31.2402	1.22392	2.65966	2.88501
305	4	23	B	29.0523	40.9754	29.9723	2.50543	3.62461	2.66663
306	4	23	C	31.3076	47.1640	21.5284	1.37943	1.59958	1.50165
307	4	24	A	29.4746	38.3229	32.2025	1.28832	1.76407	2.44983
308	4	24	B	30.2249	39.9122	29.8628	1.69166	2.60290	2.81887
309	4	24	C	31.3575	47.3187	21.3238	1.33324	1.44520	1.35920
310	4	25	A	28.8014	39.3647	31.8339	1.07601	2.46605	2.77199
311	4	25	B	28.7657	40.7028	30.5315	2.84310	3.33909	3.17580
312	4	25	C	30.6915	46.8862	22.4223	1.80213	2.27700	1.91121
313	4	26	D	26.5028	41.9542	31.5430	4.02508	6.13724	3.34857
314	4	27	E	29.6119	41.7068	28.6813	1.55275	1.61641	2.35393
315	4	28	F	28.6702	44.9187	26.4111	1.93608	3.42674	2.17646
316	4	29	G	30.8094	44.8244	24.3652	1.50517	1.78836	1.62506
317	5	1	A	29.9717	37.3994	32.6289	3.96354	3.15105	3.96073
318	5	1	B	29.6387	40.7905	29.5708	5.23757	3.64635	5.65313
319	5	1	C	31.9547	41.6447	26.4006	3.81762	4.10167	2.67918
320	5	2	A	28.6764	39.5694	31.7542	2.68213	3.63897	4.73333
321	5	2	B	29.7420	40.4771	29.7809	3.08232	4.60186	3.93319
322	5	2	C	31.1771	41.8114	27.0115	3.48077	3.85470	3.46848
323	5	3	A	31.4084	39.2291	29.3625	2.98760	3.05641	2.98663
324	5	3	B	30.6407	41.6775	27.6818	3.46667	3.53236	3.69462
325	5	3	C	30.4603	42.5635	26.9762	3.99981	4.63784	3.57016
326	5	4	A	30.9078	38.1999	30.8923	2.11399	2.35127	3.03315
327	5	4	B	30.4895	39.0513	30.4592	4.42254	5.06337	3.67547
328	5	4	C	32.0140	39.7640	28.2219	1.91196	1.61403	2.49700
329	5	5	A	29.5756	36.9420	33.4824	2.19515	2.81453	3.06090
330	5	5	B	30.9768	38.4275	30.5958	2.15863	3.04928	3.89694
331	5	5	C	30.3728	39.2827	29.8446	2.18812	2.46633	3.07693
332	5	6	A	30.5749	36.7818	32.5433	1.87738	2.39413	3.06305
333	5	6	B	30.6930	37.5716	31.7355	2.80444	4.88046	3.25706
334	5	6	C	31.9139	38.9847	29.1015	2.00844	2.35259	1.56127
335	5	7	A	31.9329	36.8053	31.2618	1.88648	4.29425	4.38678
336	5	7	B	31.1863	38.0738	30.7399	2.92094	3.68152	4.18960
337	5	7	C	32.3257	38.8370	28.8373	1.85719	2.43819	2.95010
338	5	8	A	31.5218	36.7506	31.7275	3.52654	2.43729	2.95769
339	5	8	B	29.5227	39.0808	31.3964	4.42064	4.61081	4.21463
340	5	8	C	32.8702	37.1982	29.9316	1.91560	2.28309	3.71644
341	5	9	A	31.0729	36.3709	32.5562	2.54373	1.42155	2.12564
342	5	9	B	30.2075	36.8418	32.9507	2.02983	2.97332	3.17037
343	5	9	C	31.4357	37.1671	31.3973	1.72407	2.31178	2.98338
344	5	10	A	31.5953	36.4126	31.9921	2.62404	2.79500	1.94002
345	5	10	B	30.4056	37.1326	32.4618	3.29782	3.03657	3.37007
346	5	10	C	32.2966	36.1415	31.5619	1.65889	2.05392	2.58202
347	5	11	A	30.9546	34.6434	34.4021	1.27605	2.09373	2.53936
348	5	11	B	29.8437	36.1112	34.0451	2.16339	2.65419	1.70352
349	5	11	C	32.2411	36.5414	31.2175	1.76740	2.23168	1.80358
350	5	12	A	30.9945	35.8294	33.1761	1.09603	2.30478	2.25529
351	5	12	B	29.7792	37.5289	32.6929	2.35714	4.35677	3.80662
352	5	12	C	32.4720	36.9224	30.6057	1.98300	2.17782	1.80960
353	5	13	A	31.7986	37.4912	30.7102	3.10282	2.06505	3.67542
354	5	13	B	30.4331	37.7520	31.8149	2.50390	3.84209	3.96417
355	5	13	C	31.1740	37.7401	31.0859	2.29047	2.84146	2.43098
356	5	14	A	30.4150	36.0555	33.5295	1.33276	1.28433	1.86399
357	5	14	B	29.3806	37.2791	33.3403	1.95060	2.78667	2.85208
358	5	14	C	30.2014	36.4894	33.3091	1.60251	1.80822	2.07724
359	5	15	A	29.9252	35.5222	34.5526	1.91666	1.75601	2.42214
360	5	15	B	30.9459	35.4657	33.5884	2.67092	3.37451	2.50958
361	5	15	C	31.6067	35.6749	32.7185	1.58621	1.99551	2.28919
362	5	16	A	29.7911	35.9066	34.3023	1.51630	1.78040	1.49700
363	5	16	B	30.4583	35.7590	33.7827	1.87009	2.11987	2.46666
364	5	16	C	31.5772	35.4321	32.9907	2.07859	1.94832	2.79122
365	5	17	A	30.2607	34.7101	35.0292	1.91365	2.55694	2.16019
366	5	17	B	30.8407	35.5264	33.6329	1.55257	1.11049	1.77384
367	5	17	C	31.2281	35.3522	33.4197	1.76375	2.01874	1.72858
368	5	18	A	29.4501	35.4651	35.0848	1.46915	2.60375	2.31459
369	5	18	B	29.5459	36.3086	34.1455	1.84191	1.56477	1.55689
370	5	18	C	31.7331	35.9186	32.3483	1.45796	2.14604	1.72738
371	5	19	A	31.2464	34.0512	34.7024	2.64980	2.65982	2.47270
372	5	19	B	31.6684	35.3926	32.9390	2.34261	1.92541	2.33593
373	5	19	C	31.5732	35.8296	32.5971	2.30609	2.23131	3.00069
374	5	20	A	31.0650	34.8818	34.0532	2.31184	1.77305	2.39909
375	5	20	B	32.3405	35.1088	32.5507	1.71320	1.40079	1.87083
376	5	20	C	31.9242	35.8410	32.2348	1.12026	1.79612	1.66454
377	5	21	A	33.0666	32.9617	33.9717	2.04612	1.93199	1.67371
378	5	21	B	33.4562	32.2267	34.3170	2.11716	0.96170	1.60453
379	5	21	C	32.1605	36.0214	31.8191	2.40580	2.81203	2.48478
380	5	22	A	30.9891	34.3017	34.7092	2.39503	1.45718	2.58713
381	5	22	B	31.3972	34.2652	34.3376	1.54427	2.52867	2.31686
382	5	22	C	32.0911	34.7533	33.1556	2.65462	2.29459	2.11330
383	5	23	A	30.2615	34.1815	35.5570	1.57255	1.96515	1.76383
384	5	23	B	30.3526	35.2201	33.9272	1.69252	1.55290	1.81599
385	5	23	C	30.4873	35.4373	34.0754	1.71029	1.86598	1.74290

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
386	5	24	A	30.9790	33.8392	35.1818	1.71999	1.23428	1.71064
387	5	24	B	30.7261	34.8152	34.4587	1.81135	2.14281	2.24476
388	5	24	C	30.4776	35.8169	33.7055	1.87042	1.78616	2.05468
389	5	25	A	32.5223	33.8127	33.6651	1.72132	1.83804	1.61848
390	5	25	B	33.3436	33.5647	33.0917	1.74056	2.01894	2.16173
391	5	25	C	33.3762	34.9531	31.6707	2.33907	2.66832	1.80[illegible]40
392	5	26	D	34.8269	32.7623	32.4109	1.51213	1.57360	1.79334
393	5	27	E	33.7960	34.0039	32.2001	1.92500	1.14411	2.25204
394	5	28	F	33.6904	35.3758	30.9338	1.75929	2.05314	2.05824
395	5	29	G	33.1175	34.7733	32.1091	2.98294	2.32272	3.04030
396	6	1	A	29.3290	41.5751	29.0959	2.97990	2.17098	2.75651
397	6	1	B	31.1833	42.0586	26.7580	2.66159	3.86823	3.83922
398	6	1	C	30.8683	44.7093	24.4223	2.82173	3.25296	2.68875
399	6	2	A	27.5896	40.9703	31.4401	2.43683	1.55895	2.16249
400	6	2	B	30.0013	40.6268	29.3719	2.21470	4.19210	3.57863
401	6	2	C	32.0947	42.5468	25.3585	3.49986	3.45131	3.22331
402	6	3	A	28.6569	39.3600	31.9831	2.08489	2.73159	2.09635
403	6	3	B	27.2970	40.2083	32.4947	4.46527	3.51013	2.66402
404	6	3	C	29.7785	46.8391	23.3824	3.26584	3.52874	2.55455
405	6	4	A	28.0751	39.8279	32.0970	2.72074	2.87052	2.94209
406	6	4	B	29.2166	41.0845	29.6989	3.51385	4.85301	3.89280
407	6	4	C	32.5745	42.7167	24.7088	2.43828	2.95275	3.54352
408	6	5	A	28.3058	39.8368	31.8574	2.09159	2.63308	2.73982
409	6	5	B	29.2461	37.9449	32.8090	4.51533	3.57902	3.55900
410	6	5	C	32.4357	45.0399	22.5244	2.42529	2.45479	1.50767
411	6	6	A	26.9617	39.4291	33.6092	1.94970	2.79984	3.54627
412	6	6	B	30.6380	38.4885	30.8736	3.36385	5.54856	3.62868
413	6	6	C	32.3634	44.3638	23.2727	3.04628	3.21291	2.72165
414	6	7	A	29.3592	40.4507	30.1901	3.98876	2.44243	3.37069
415	6	7	B	29.6987	37.0941	33.2072	3.74602	3.32894	2.86423
416	6	7	C	31.6494	45.9224	22.4282	2.87592	2.87424	1.68852
417	6	8	A	28.7084	40.4391	30.8526	2.39905	2.22465	1.55492
418	6	8	B	30.5278	39.6116	29.8606	2.69498	3.99797	3.28475
419	6	8	C	31.8489	46.0499	22.1012	2.40184	2.61099	1.57969
420	6	9	A	31.0824	39.1015	29.8161	4.39237	2.59138	2.68816
421	6	9	B	28.9623	40.8589	30.1787	3.36286	3.21473	2.64990
422	6	9	C	31.8141	46.3620	21.8239	2.87649	2.52386	1.90000
423	6	10	A	27.4195	40.9234	31.6571	3.14584	2.72450	2.45445
424	6	10	B	30.3666	40.0257	29.6077	1.97065	3.14730	2.88636
425	6	10	C	31.8779	45.0537	23.0684	3.19802	4.23248	2.50687
426	6	11	A	28.4768	40.5004	31.0228	1.73584	1.94591	2.88394
427	6	11	B	28.7235	42.5487	28.7278	3.33376	3.51232	3.85864
428	6	11	C	31.1094	46.5835	22.3071	2.95370	3.20753	2.24089
429	6	12	A	26.9779	41.5522	31.4699	2.75341	1.91769	2.31616
430	6	12	B	29.2131	40.9121	29.8747	1.16443	3.24018	3.12681
431	6	12	C	31.0052	46.3241	22.6707	2.27146	2.32672	2.20109
432	6	13	A	29.5677	40.4002	30.0321	2.80792	2.70801	2.57982
433	6	13	B	30.2419	39.1664	30.5918	3.19027	3.41780	3.71731
434	6	13	C	30.7587	46.2288	23.0125	3.62103	3.75263	2.36956
435	6	14	A	29.0141	39.9117	31.0742	2.11596	2.46548	2.44332
436	6	14	B	30.4975	41.4282	28.0743	1.51693	2.49431	2.91361
437	6	14	C	31.5004	45.2274	23.2722	1.90161	2.27378	1.53737
438	6	15	A	27.0366	40.6050	32.3584	1.09299	1.32530	1.80849
439	6	15	B	29.1089	41.5681	29.3230	0.97843	4.25266	4.12635
440	6	15	C	30.2021	45.6779	24.1200	2.80287	2.92448	2.54999
441	6	16	A	27.0344	40.2068	32.7589	2.06256	1.55318	1.98857
442	6	16	B	28.2571	40.8492	30.8937	1.88241	3.04545	3.15418
443	6	16	C	29.8617	44.3993	25.7390	2.49123	3.40236	2.85177
444	6	17	A	26.4286	45.3888	28.1826	1.51179	2.42957	2.29047
445	6	17	B	28.0927	42.7133	29.1940	2.08209	1.87465	2.40783
446	6	17	C	29.5266	45.7143	24.7590	2.27066	3.05894	2.24960
447	6	18	A	25.4945	47.2993	27.2062	2.46790	3.12591	2.06672
448	6	18	B	28.2036	45.1504	26.6461	2.82231	3.94139	3.04881
449	6	19	C	30.7580	44.3524	24.8896	2.17585	2.91354	2.15788
450	6	19	A	26.3633	44.8035	28.8333	1.52667	3.41930	3.22635
451	6	19	B	27.1867	45.1818	27.6314	1.90280	3.71501	3.29642
452	6	19	C	28.8274	46.9113	24.2613	2.51685	2.36635	2.24634
453	6	20	A	23.9554	48.6137	27.4308	1.31378	2.52407	2.35012
454	6	20	B	25.6522	46.0837	28.2641	1.38369	3.02216	2.41997
455	6	20	C	26.6467	48.0653	25.2880	1.35875	3.23932	2.61899
456	6	21	A	24.2103	46.4216	29.3681	2.01682	2.12407	2.47684
457	6	21	B	24.8933	44.6585	30.4481	2.12091	2.70860	2.24936
458	6	21	C	27.0192	44.8447	28.1361	1.54082	2.46425	2.47942
459	6	22	A	23.4248	47.4918	29.0834	1.36635	2.15971	2.08131
460	6	22	B	25.2356	46.2295	28.5350	2.18848	2.89855	2.51701
461	6	22	C	26.1552	46.6163	27.2285	1.31053	2.67190	2.40055
462	6	23	A	23.6159	48.4981	27.8859	0.79742	1.99865	2.06682
463	6	23	B	24.7637	47.6613	27.5750	1.83686	3.13217	2.18259
464	6	23	C	26.7735	46.4668	26.7597	1.45439	2.65721	2.50239
465	6	24	A	22.1190	48.1332	29.7478	1.44926	2.72910	2.41888
466	6	24	B	24.7363	46.4268	28.8359	1.95090	2.73617	2.53109
467	6	24	C	26.0386	46.5925	27.3689	1.69272	2.88581	2.30174
468	6	25	A	23.4390	46.2940	30.2670	1.67329	2.73912	2.58070
469	6	25	B	23.5925	45.5936	30.8139	2.10591	2.88569	2.93732
470	6	25	C	25.4265	47.9616	26.5119	2.11060	3.09789	3.49351
471	6	26	D	20.9283	50.5166	28.5551	1.25199	1.51813	1.52112
472	6	27	E	19.3061	53.0320	27.6619	2.34731	2.23257	2.24693
473	6	28	F	22.8124	50.6051	26.5825	2.34865	3.23410	1.83937
474	6	29	G	23.5207	47.8194	28.6598	2.59593	3.64680	2.85318

Table 6

Error Scores Means and Standard Deviations (in Msec) for Acquisition (Block 1-24) and Retention (24-Hr, Block 25-28; 1-Wk, Block 29-32) for Experiment 2 (Task: A=Blue, B=White, C=Red, Block 25=Green, Block 26=Orange, Block 27=White, Block 28=Red, Block 29=Blue, Block 30=White, Block 31=Grey, Block 32=Yellow)

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
1	1	1	A	43.07	112.533	132.337	77.0194
2	1	1	B	-32.50	99.125	108.953	50.1662
3	1	1	C	19.79	40.947	55.225	33.7153
4	1	2	A	-72.39	109.278	99.383	53.6742
5	1	2	B	-50.94	75.813	75.510	49.9069
6	1	2	C	81.25	84.375	37.931	84.7332
7	1	3	A	-11.63	49.375	59.749	49.0780
8	1	3	B	28.94	53.611	62.635	42.0352
9	1	3	C	65.25	81.375	89.538	74.1286
10	1	4	A	-16.69	59.063	70.939	40.1056
11	1	4	B	59.47	86.412	91.019	48.3685
12	1	4	C	62.65	79.647	35.018	69.4703
13	1	5	A	-11.12	53.000	63.532	34.5796
14	1	5	B	14.27	69.733	33.401	44.3146
15	1	5	C	14.22	59.657	59.650	35.9967
16	1	6	A	11.44	32.222	41.392	28.1833
17	1	6	B	18.39	55.722	53.284	32.7913
18	1	6	C	46.14	58.000	57.432	43.1313
19	1	7	A	-119.65	119.647	57.419	67.4193
20	1	7	B	-37.31	60.231	55.610	43.3881
21	1	7	C	9.30	54.500	59.387	41.5444
22	1	8	A	-13.71	44.000	53.110	30.5318
23	1	8	B	12.65	48.913	53.137	32.3432
24	1	8	C	72.85	85.759	61.532	39.7223
25	1	9	A	-14.57	47.048	62.514	42.6538
26	1	9	B	37.25	52.753	45.753	26.4159
27	1	9	C	55.00	58.0[illegible]	50.729	44.0955
28	1	10	A	-20.23	35.000	42.940	30.9946
29	1	10	B	37.83	49.722	56.532	45.7574
30	1	10	C	24.05	73.253	59.490	46.4074
31	1	11	A	-25.89	42.579	43.337	27.7755
32	1	11	B	12.53	48.059	58.361	33.4486
33	1	11	C	-0.50	39.786	44.311	25.0912
34	1	12	A	-20.56	51.583	59.960	34.5000
35	1	12	B	6.59	35.452	39.781	16.3942
36	1	12	C	-37.10	47.381	43.198	30.8828
37	1	13	A	-48.06	69.705	33.739	65.5018
38	1	13	B	-8.31	45.313	54.594	44.2519
39	1	13	C	-14.75	51.706	50.393	42.4157
40	1	14	A	15.69	32.154	38.161	24.5555
41	1	14	B	4.32	30.135	35.749	19.4659
42	1	14	C	58.89	62.889	51.254	45.9474
43	1	15	A	-17.40	24.867	33.968	29.5604
44	1	15	B	27.35	38.882	37.578	24.5099
45	1	15	C	56.44	62.333	45.904	36.9674
46	1	16	A	-5.00	25.296	32.713	18.7880
47	1	16	B	29.11	34.737	35.479	28.5140
48	1	16	C	19.35	37.000	45.029	31.1589
49	1	17	A	1.00	33.444	41.125	22.5394
50	1	17	B	-10.29	36.059	43.074	24.2164
51	1	17	C	29.47	49.533	31.615	32.7215
52	1	18	A	-16.81	31.000	33.570	20.3617
53	1	18	B	12.36	29.300	39.752	29.7658
54	1	18	C	-13.44	30.444	32.398	17.0957
55	1	19	A	0.39	29.944	16.793	21.5883

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
56	1	19	B	8.611	52.611	64.825	36.743
57	1	19	C	44.571	61.857	59.508	39.497
58	1	20	A	-34.214	42.500	41.523	32.244
59	1	20	B	12.500	47.500	53.269	24.446
60	1	20	C	6.900	42.500	56.948	37.307
61	1	21	A	-18.533	25.733	23.910	15.173
62	1	21	B	16.455	38.636	42.275	22.517
63	1	21	C	28.308	45.692	45.520	27.924
64	1	22	A	-15.250	25.625	30.396	20.392
65	1	22	B	11.706	21.588	23.550	14.318
66	1	22	C	25.941	35.119	36.962	27.764
67	1	23	A	-24.143	29.857	26.379	19.283
68	1	23	B	5.467	22.000	29.715	19.911
69	1	23	C	15.286	41.571	46.954	24.396
70	1	24	A	-17.625	24.250	24.687	17.707
71	1	24	B	8.167	21.333	24.357	13.020
72	1	24	C	-2.318	36.955	44.749	24.031
73	1	25	E	-24.900	47.100	58.468	40.528
74	1	26	G	-4.000	39.600	50.297	28.375
75	1	27	D	-47.700	47.700	25.232	25.232
76	1	28	F	19.400	33.000	35.532	21.695
77	1	29	D	207.800	207.800	54.428	54.428
78	1	30	F	275.100	275.100	45.225	45.226
79	1	31	E	205.500	205.500	48.441	48.441
80	1	32	G	223.800	223.800	44.959	44.959
81	2	1	A	-32.875	119.875	161.606	109.277
82	2	1	B	-4.779	93.444	130.578	88.483
83	2	1	C	23.063	100.438	117.096	59.319
84	2	2	A	-62.739	121.315	134.578	82.083
85	2	2	B	-25.353	71.059	89.262	57.799
86	2	2	C	43.714	100.286	116.805	69.789
87	2	3	A	3.500	119.214	157.756	97.953
88	2	3	B	-46.125	78.875	97.531	71.734
89	2	3	C	73.850	83.250	86.198	76.652
90	2	4	A	-38.800	109.333	144.287	98.102
91	2	4	B	-16.200	80.200	94.007	47.191
92	2	4	C	61.400	102.100	119.708	85.588
93	2	5	A	-93.200	100.000	69.024	58.150
94	2	5	B	3.813	81.313	104.162	61.746
95	2	5	C	10.214	73.071	105.631	74.297
96	2	6	A	-17.375	55.625	73.499	49.422
97	2	6	B	-9.056	75.611	89.057	44.324
98	2	6	C	21.750	65.125	78.000	45.437
99	2	7	A	5.353	62.294	78.533	45.550
100	2	7	B	9.600	80.900	101.519	59.278
101	2	7	C	112.000	112.154	97.221	87.007
102	2	8	A	-35.462	53.000	58.804	42.156
103	2	8	B	9.200	92.133	106.428	48.194
104	2	8	C	41.591	85.955	94.350	54.536
105	2	9	A	-6.000	92.381	113.207	62.391
106	2	9	B	-22.250	47.917	58.636	38.387
107	2	9	C	45.059	65.059	69.464	49.853
108	2	10	A	2.643	76.071	83.926	28.621
109	2	10	B	-17.167	71.833	92.335	58.087
110	2	10	C	4.333	25.556	33.452	21.153
111	2	11	A	-8.25	74.789	104.796	71.7639
112	2	11	B	24.86	110.857	123.737	52.3595
113	2	11	C	-11.35	52.647	62.197	32.5652
114	2	12	A	38.50	83.000	112.107	82.4670
115	2	12	B	-5.05	52.476	70.480	45.8559
116	2	12	C	-14.54	55.615	70.167	42.4451
117	2	13	A	-13.24	45.706	65.449	47.4352
118	2	13	B	7.29	55.059	70.508	42.5080
119	2	13	C	2.00	33.125	41.865	24.2181
120	2	14	A	-14.47	55.257	67.538	38.8982
121	2	14	B	31.47	80.647	90.565	48.4135
122	2	14	C	-23.11	42.222	42.368	21.7487
123	2	15	A	-18.38	50.077	57.368	30.6688
124	2	15	B	35.95	81.857	103.722	71.2736
125	2	15	C	39.25	73.500	81.404	50.0746
126	2	16	A	-10.78	62.333	80.897	50.5301
127	2	16	B	22.21	44.214	71.538	59.6505
128	2	16	C	-1.78	57.657	69.745	36.5959
129	2	17	A	6.17	57.833	78.434	51.4853
130	2	17	B	44.86	73.429	91.644	55.0101
131	2	17	C	41.44	69.889	91.317	57.0911
132	2	18	A	-36.35	65.059	70.030	42.5580
133	2	18	B	-3.60	45.000	57.473	34.4261
134	2	18	C	21.00	40.231	42.687	23.3779
135	2	19	A	4.75	73.941	104.817	72.1236
136	2	19	B	26.21	66.929	85.696	57.0957
137	2	19	C	11.05	51.368	64.504	38.7860
138	2	20	A	-29.27	48.467	58.609	42.8483
139	2	20	B	12.90	75.381	100.595	65.7864
140	2	20	C	-24.43	43.429	51.095	34.9609
141	2	21	A	6.31	78.688	97.440	54.1538
142	2	21	B	-17.46	77.309	94.871	53.4437
143	2	21	C	-32.00	47.714	54.027	40.0452
144	2	22	A	-26.89	69.889	82.821	49.5294
145	2	22	B	-36.50	55.750	56.196	35.5500
146	2	22	C	-27.31	42.313	50.480	37.8712
147	2	23	A	-43.33	49.524	48.956	42.3457
148	2	23	B	-0.07	35.500	52.507	37.4140
149	2	23	C	1.07	43.467	54.493	30.7638
150	2	24	A	5.77	37.923	45.542	25.3820
151	2	24	B	4.59	38.591	49.219	28.0538
152	2	24	C	17.67	33.800	36.122	20.3758
153	2	25	E	-70.60	78.400	63.162	51.9427
154	2	26	G	-87.10	87.100	48.549	48.5488
155	2	27	D	-105.20	115.600	70.473	49.1420
156	2	28	F	-113.60	114.600	56.524	54.3389
157	2	29	D	-212.40	212.400	61.715	61.7148
158	2	30	F	-142.60	142.600	49.996	49.9960
159	2	31	E	-120.50	130.700	87.978	69.9509
160	2	32	G	-17.50	75.300	91.946	49.9423
161	3	1	A	29.44	87.563	105.057	61.5066
162	3	1	B	-25.72	107.333	143.292	94.4521
163	3	1	C	45.31	94.553	122.085	86.9283
164	3	2	A	-56.71	76.000	74.751	53.2108
165	3	2	B	26.59	89.647	107.517	61.4186

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
166	3	2	C	37.316	63.421	67.521	42.2286
167	3	3	A	40.000	114.000	145.295	94.8802
168	3	3	B	28.786	85.500	95.587	46.4406
169	3	3	C	5.000	65.316	86.414	54.6860
170	3	4	A	-60.125	99.625	127.255	97.2775
171	3	4	B	1.944	97.611	121.355	68.1367
172	3	4	C	74.250	99.750	108.753	84.2279
173	3	5	A	-21.000	102.053	137.765	91.9314
174	3	5	B	-0.400	100.267	124.271	68.3525
175	3	5	C	25.813	57.813	65.229	37.4223
176	3	6	A	15.500	72.944	89.290	50.9238
177	3	6	B	15.722	56.944	69.794	41.2260
178	3	6	C	56.214	67.643	80.155	70.0029
179	3	7	A	-25.059	66.588	82.613	52.7353
180	3	7	B	13.267	63.800	80.092	47.3516
181	3	7	C	12.111	58.779	66.555	30.4448
182	3	8	A	-6.500	60.000	77.064	46.3033
183	3	8	B	4.941	60.235	79.604	50.0769
184	3	8	C	55.824	73.000	80.674	64.4767
185	3	9	A	-61.188	84.438	82.564	56.5156
186	3	9	B	12.688	65.813	96.739	70.0725
187	3	9	C	44.167	106.056	120.444	68.2853
188	3	10	A	-20.583	65.583	84.667	54.2074
189	3	10	B	15.955	83.409	99.995	54.5646
190	3	10	C	57.500	103.375	125.543	88.8188
191	3	11	A	-8.706	51.175	65.844	40.4139
192	3	11	B	18.905	57.190	73.748	48.7828
193	3	11	C	70.667	80.500	57.607	41.1947
194	3	12	A	-31.818	76.815	87.617	50.5500
195	3	12	B	-26.222	95.778	116.712	63.8372
196	3	12	C	60.211	71.474	60.830	46.2029
197	3	13	A	-38.529	52.882	63.184	50.9729
198	3	13	B	20.824	66.941	87.242	57.5385
199	3	13	C	10.875	57.250	73.653	45.3306
200	3	14	A	-35.636	54.364	55.588	35.1576
201	3	14	B	5.842	84.158	100.784	52.1283
202	3	14	C	35.700	54.200	63.323	47.5302
203	3	15	A	-33.250	58.417	64.399	40.3810
204	3	15	B	10.105	61.684	75.420	42.1862
205	3	15	C	31.474	37.474	35.942	29.2430
206	3	16	A	-82.000	85.625	59.574	53.8602
207	3	16	B	-31.813	76.813	80.585	35.7756
208	3	16	C	36.222	71.222	76.616	43.4546
209	3	17	A	-19.833	52.056	67.859	46.3915
210	3	17	B	-24.000	57.200	59.042	43.9217
211	3	17	C	69.500	75.500	70.803	63.7488
212	3	18	A	-7.250	32.917	40.248	23.3274
213	3	18	B	5.286	37.857	44.339	18.0687
214	3	18	C	36.211	63.579	68.924	43.2169
215	3	19	A	-36.000	56.000	62.820	44.5248
216	3	19	B	12.294	56.647	72.741	45.1926
217	3	19	C	35.625	83.125	99.968	63.0628
218	3	20	A	-17.800	62.200	70.446	31.8741
219	3	20	B	8.455	43.000	58.950	40.1616
220	3	20	C	21.167	59.167	70.910	42.3796
221	3	21	A	-23.07	33.500	33.790	22.504
222	3	21	B	17.94	42.882	54.253	36.491
223	3	21	C	8.11	42.211	53.756	32.837
224	3	22	A	7.22	44.778	52.997	27.219
225	3	22	B	1.60	32.200	40.023	22.652
225	3	22	C	41.25	47.750	51.145	44.551
227	3	23	A	0.79	32.071	40.313	22.761
229	3	23	B	16.68	54.474	64.362	36.112
229	3	23	C	53.00	66.765	57.382	39.258
230	3	24	A	-21.52	35.667	37.181	23.286
231	3	24	B	-31.80	37.800	35.563	27.253
232	3	24	C	-0.22	34.667	45.178	27.723
233	3	25	E	-16.30	43.900	45.003	16.435
234	3	26	G	84.10	91.900	68.955	56.828
235	3	27	D	-36.50	43.900	42.631	34.005
236	3	28	F	3.80	57.400	70.000	35.428
237	3	29	D	33.90	40.900	52.543	46.680
238	3	30	F	98.00	110.600	115.192	101.729
239	3	31	E	49.30	82.200	84.472	48.921
240	3	32	G	199.00	199.000	58.977	68.977
241	4	1	A	-129.28	168.333	158.532	112.458
242	4	1	B	-88.35	138.113	157.181	126.391
243	4	1	C	29.20	121.500	144.990	78.057
244	4	2	A	10.41	87.324	107.948	59.774
245	4	2	B	26.44	83.111	135.793	67.963
246	4	2	C	55.13	95.800	120.011	95.471
247	4	3	A	-28.13	129.500	154.177	82.013
248	4	3	B	-42.07	66.333	90.570	73.379
249	4	3	C	-65.74	109.315	109.171	62.175
250	4	4	A	40.40	127.733	135.938	52.410
251	4	4	B	34.75	134.375	163.554	92.919
252	4	4	C	-49.74	73.947	88.297	68.085
253	4	5	A	15.82	87.412	109.293	62.527
254	4	5	B	24.17	74.511	90.101	53.314
255	4	5	C	-29.87	76.600	88.375	49.155
256	4	6	A	11.41	56.471	73.284	46.050
257	4	6	B	-1.50	51.750	56.849	40.182
258	4	6	C	2.00	55.765	77.210	51.590
259	4	7	A	-54.05	93.650	99.108	60.545
260	4	7	B	-16.11	45.556	55.472	33.980
261	4	7	C	-11.92	64.750	81.093	46.447
262	4	8	A	-30.67	62.133	72.199	45.651
263	4	8	B	12.25	77.917	87.352	34.222
264	4	8	C	-27.22	66.609	76.359	44.348
265	4	9	A	8.92	73.250	90.257	48.782
266	4	9	B	16.10	91.714	114.428	67.333
267	4	9	C	-8.94	61.412	71.177	33.823
268	4	10	A	30.06	86.611	107.732	67.971
269	4	10	B	40.23	82.845	80.128	27.175
270	4	10	C	33.79	48.632	52.822	38.716
271	4	11	A	53.57	72.714	77.687	58.583
272	4	11	B	58.84	77.684	68.899	45.075
273	4	11	C	55.65	73.412	91.054	76.516
274	4	12	A	-5.29	31.190	40.524	25.496
275	4	12	B	-10.35	59.294	70.667	37.043

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTD
276	4	12	C	13.67	33.167	44.508	31.3799
277	4	13	A	-55.06	70.706	67.201	49.2453
278	4	13	B	13.76	54.000	71.329	46.8068
279	4	13	C	-11.94	49.313	60.175	34.3389
280	4	14	A	5.89	80.333	96.929	50.9787
281	4	14	B	4.77	63.077	78.339	43.0280
282	4	14	C	17.58	65.368	74.018	35.9787
283	4	15	A	-7.94	65.722	84.274	50.9461
284	4	15	B	55.81	70.063	66.618	50.2454
285	4	15	C	11.88	45.500	61.555	41.5077
286	4	16	A	11.17	48.833	60.218	35.1187
287	4	16	B	26.71	65.857	78.989	48.3431
288	4	16	C	-17.61	71.167	82.728	42.5403
289	4	17	A	78.60	93.667	87.449	69.7605
290	4	17	B	38.72	69.500	87.825	64.7032
291	4	17	C	34.53	64.529	71.393	44.0385
292	4	18	A	-21.35	45.706	51.152	29.5875
293	4	18	B	-17.95	44.350	51.913	31.0437
294	4	18	C	-39.23	44.923	36.827	28.9352
295	4	19	A	-3.29	58.857	80.719	52.8828
296	4	19	B	-16.53	67.118	91.038	61.5781
297	4	19	C	-20.53	55.053	71.719	48.8791
298	4	20	A	29.24	74.286	83.143	44.9000
299	4	20	B	48.38	53.923	66.144	61.3290
300	4	20	C	-15.81	37.813	51.024	36.5755
301	4	21	A	38.46	74.923	93.362	65.0980
302	4	21	B	34.18	65.941	82.920	59.1338
303	4	21	C	-31.70	60.700	65.505	38.3435
304	4	22	A	-19.56	45.889	51.290	28.3878
305	4	22	B	59.11	72.889	77.403	63.7614
306	4	22	C	37.36	81.500	90.562	50.5093
307	4	23	A	-65.67	65.667	39.759	39.7594
308	4	23	B	-49.70	70.800	68.623	45.0854
309	4	23	C	-56.33	58.333	35.498	32.9603
310	4	24	A	-20.68	51.632	59.152	33.7148
311	4	24	B	-9.87	43.333	52.712	29.5119
312	4	24	C	-36.25	45.625	42.167	30.9728
313	4	25	E	-73.50	83.500	73.447	60.4157
314	4	26	G	-90.00	90.000	41.172	41.1717
315	4	27	D	-125.90	125.900	36.689	36.6892
316	4	28	F	-108.40	108.400	45.693	45.6927
317	4	29	D	65.70	75.500	64.215	50.8533
318	4	30	F	137.70	137.700	51.974	51.9745
319	4	31	E	116.20	116.200	38.706	38.7063
320	4	32	G	155.80	155.800	49.607	49.5069
321	5	1	A	-21.75	97.625	127.170	80.6903
322	5	1	B	-8.25	65.625	89.313	58.7853
323	5	1	C	34.17	99.500	129.877	87.3002
324	5	2	A	-36.94	58.235	66.765	48.0020
325	5	2	B	-35.69	67.438	70.795	38.9803
326	5	2	C	6.76	72.529	95.649	60.0668
327	5	3	A	-9.06	38.833	47.994	28.1702
328	5	3	B	-30.88	32.000	35.383	34.3006
329	5	3	C	50.38	62.125	56.179	41.7866
330	5	4	A	-10.64	35.909	46.166	28.9360
331	5	4	B	-8.050	38.0500	45.707	26.9395
332	5	4	C	30.368	46.1579	43.967	25.6456
333	5	5	A	-13.875	26.7083	31.017	20.4588
334	5	5	B	-12.500	38.3571	45.229	25.0894
335	5	5	C	15.417	37.2500	45.783	30.5648
336	5	6	A	-33.500	36.0714	34.101	31.1484
337	5	6	B	12.000	30.5556	40.769	28.7407
338	5	6	C	10.444	38.4444	48.954	30.7747
339	5	7	A	-25.846	49.5923	60.237	40.9520
340	5	7	B	-17.550	41.4500	47.009	26.9355
341	5	7	C	-16.706	39.0588	119.052	77.7347
342	5	8	A	-4.870	31.6522	40.062	24.1315
343	5	8	B	-0.615	23.0769	29.540	17.2069
344	5	8	C	21.571	45.7143	58.172	40.4293
345	5	9	A	-41.188	45.8125	36.824	30.4439
346	5	9	B	-18.286	29.8571	36.233	26.7002
347	5	9	C	4.250	47.0500	52.180	39.4348
348	5	10	A	-9.053	20.7368	27.553	19.7929
349	5	10	B	-8.667	30.1111	40.729	27.8987
350	5	10	C	0.154	26.3077	35.433	22.4885
351	5	11	A	-4.824	24.5882	30.629	17.9027
352	5	11	B	-4.857	35.5714	44.645	25.5116
353	5	11	C	4.526	45.1579	54.425	28.8295
354	5	12	A	-12.333	25.8333	26.969	12.8547
355	5	12	B	10.524	31.5714	35.905	18.9435
356	5	12	C	-27.412	39.0588	35.658	21.1881
357	5	13	A	-31.175	40.0000	48.800	41.4020
358	5	13	B	-8.119	25.9412	32.825	19.3987
359	5	13	C	-30.625	52.1250	55.466	34.3334
360	5	14	A	-4.556	19.0000	24.791	15.9484
361	5	14	B	5.611	28.7222	33.546	16.8865
362	5	14	C	24.071	27.7857	27.314	23.2087
363	5	15	A	-10.706	34.4705	44.893	29.5743
364	5	15	B	5.350	38.9500	45.309	22.0465
365	5	15	C	50.077	53.7692	51.998	31.8595
366	5	16	A	3.500	18.3182	22.375	12.7256
367	5	16	B	-5.353	22.1175	29.964	20.5179
368	5	16	C	18.455	36.6364	44.898	30.2333
369	5	17	A	-29.304	39.7391	38.386	26.8383
370	5	17	B	-9.118	22.6471	30.145	21.2631
371	5	17	C	24.000	36.2000	38.566	25.9092
372	5	18	A	-48.000	48.0000	.	.
373	5	18	B	-38.500	43.0714	35.333	29.1005
374	5	18	C	-8.771	28.0857	31.382	15.8752
375	5	19	A	5.313	41.8125	51.461	28.5218
376	5	19	B	11.889	50.4444	64.002	39.3898
377	5	19	C	-15.063	44.5625	54.399	32.9099
378	5	20	A	40.525	50.0000	48.423	37.9415
379	5	20	B	12.063	45.0625	60.105	40.0224
380	5	20	C	-5.933	26.0667	32.438	19.0243
381	5	21	A	-22.529	34.4118	45.274	36.4813
382	5	21	B	-9.313	30.1875	41.569	29.1278
383	5	21	C	-4.547	30.5294	45.724	34.8678
384	5	22	A	-25.412	32.4706	33.528	26.2681
385	5	22	B	-34.000	37.3333	33.981	29.9992

OBS	ID	BLOCK	TASK	CE	AE	VE	AESTO
385	5	22	C	11.944	34.167	44.510	29.936
387	5	23	A	26.462	37.692	42.993	32.679
388	5	23	B	17.591	44.318	55.966	37.399
389	5	23	C	8.067	22.733	31.925	23.135
390	5	24	A	0.611	27.722	36.021	22.005
391	5	24	B	2.846	37.615	45.567	23.500
392	5	24	C	17.737	31.737	38.439	27.321
393	5	25	E	69.000	69.000	35.226	35.226
394	5	26	G	28.200	35.600	32.785	23.458
395	5	27	D	57.900	63.300	69.568	64.128
396	5	28	F	82.100	82.100	51.028	51.028
397	5	29	D	84.400	84.400	33.646	33.646
398	5	30	F	109.500	109.500	35.613	35.613
399	5	31	E	102.700	102.700	31.648	31.648
400	5	32	G	121.100	121.100	27.123	27.123
401	6	1	A	-24.765	100.882	117.718	60.794
402	6	1	B	-14.063	100.689	127.659	75.457
403	6	1	C	-51.941	90.412	116.132	87.567
404	6	2	A	-87.875	90.250	78.044	75.098
405	6	2	B	-50.579	101.947	113.670	68.195
406	6	2	C	18.000	52.800	61.822	34.383
407	6	3	A	58.118	102.000	114.075	74.482
408	6	3	B	43.706	83.471	87.646	48.048
409	6	3	C	29.438	57.313	79.671	61.385
410	6	4	A	-5.800	107.000	131.749	71.603
411	6	4	B	-37.143	95.143	103.750	50.014
412	6	4	C	31.810	67.048	100.859	80.714
413	6	5	A	61.700	97.700	133.031	107.967
414	6	5	B	-21.706	79.235	129.218	101.340
415	6	5	C	-2.615	54.769	66.422	34.201
416	6	6	A	-37.133	83.667	102.024	66.229
417	6	6	B	4.824	41.647	59.712	41.802
418	6	6	C	-63.222	70.889	54.054	42.815
419	6	7	A	-75.650	90.850	73.861	52.834
420	6	7	B	-29.000	51.923	60.190	40.165
421	6	7	C	5.647	45.941	59.863	35.725
422	6	8	A	50.385	96.385	123.088	95.061
423	6	8	B	-11.130	67.304	82.532	46.960
424	6	8	C	-3.786	51.786	63.283	33.648
425	6	9	A	-49.133	85.133	96.773	64.700
426	6	9	B	-36.125	56.625	70.499	54.240
427	6	9	C	4.421	50.632	58.925	28.050
428	6	10	A	-27.316	76.253	89.250	51.127
429	6	10	B	46.706	77.059	77.745	45.308
430	6	10	C	35.357	67.500	73.452	42.834
431	6	11	A	-39.800	67.133	82.735	60.938
432	6	11	B	19.235	41.824	51.615	34.622
433	6	11	C	-20.611	49.944	58.016	34.271
434	6	12	A	-16.778	50.556	63.266	39.930
435	6	12	B	20.643	51.357	54.933	25.221
436	6	12	C	28.111	57.333	62.226	35.048
437	6	13	A	-15.353	83.706	100.500	53.908
438	6	13	B	-10.625	45.000	56.036	33.172
439	6	13	C	-12.588	35.176	41.775	24.470
440	6	14	A	-10.667	29.556	39.774	27.885
441	6	14	B	23.11	33.778	36.939	26.869
442	6	14	C	0.29	24.429	32.178	19.821
443	6	15	A	-14.71	60.706	81.105	53.781
444	6	15	B	42.33	48.444	40.662	32.650
445	6	15	C	31.73	47.200	52.419	37.944
446	6	16	A	5.63	42.474	57.739	38.250
447	6	16	B	62.31	81.438	83.466	63.515
448	6	16	C	37.00	55.533	67.018	51.517
449	6	17	A	-38.36	54.214	53.845	36.311
450	6	17	B	42.06	61.353	66.977	48.641
451	6	17	C	12.42	54.526	65.908	36.993
452	6	18	A	-36.44	42.333	37.538	30.297
453	6	18	B	18.71	51.000	54.504	23.383
454	6	18	C	13.83	47.278	57.180	33.249
455	6	19	A	-15.07	48.071	59.918	36.691
456	6	19	B	21.83	63.055	81.325	53.932
457	6	19	C	7.28	54.944	65.661	34.220
458	6	20	A	-6.05	45.250	56.376	32.580
459	6	20	B	42.81	54.688	59.392	47.879
460	6	20	C	20.29	42.429	57.197	42.142
461	6	21	A	-14.23	51.154	66.111	41.896
462	6	21	B	18.00	45.739	65.466	49.370
463	6	21	C	29.21	54.643	64.610	43.337
464	6	22	A	6.39	34.278	46.978	31.719
465	6	22	B	23.79	56.214	68.930	44.244
466	6	22	C	37.83	58.500	64.118	44.756
467	6	23	A	-10.20	37.133	44.127	24.109
468	6	23	B	-8.57	47.714	60.077	35.164
469	6	23	C	12.38	39.143	61.740	48.621
470	6	24	A	-28.40	43.000	40.237	22.840
471	6	24	B	-47.27	47.257	31.811	31.811
472	6	24	C	-11.07	25.457	32.003	21.460
473	6	25	E	-22.10	68.300	78.694	39.398
474	6	26	G	-128.30	128.300	39.362	39.362
475	6	27	D	-112.90	113.300	72.319	61.991
476	6	28	F	-25.60	71.800	86.842	50.416
477	6	29	D	160.70	160.700	107.812	107.812
478	6	30	F	206.50	206.500	99.599	99.599
479	6	31	E	151.30	151.300	80.365	80.365
480	6	32	G	181.30	181.300	82.647	82.647

Table 7

Relative Time Means and Standard Deviations (in Percent) for Acquisition (Block 1-24) and Retention (24-Hr, Block 25-28, 1-Wk, Block 29-32) for Experiment 2 (Task: A=Blue, B=White, C=Red, Block 25=Green, Block 26=Orange, Block 27=White, Block 28=Red, Block 29=Blue, Block 30=White, Block 31=Grey, Block 32=Yellow, Ret1=Relative Time, Segment 1, Ret2=Relative Time, Segment 2, Ret3=Relative Time, Segment 3)

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
1	1	1	A	30.3281	37.3916	32.2803	4.85416	6.13328	6.05173
2	1	1	B	30.6580	35.3967	33.9452	3.37294	3.03612	4.60192
3	1	1	C	30.3340	44.3447	25.3213	3.35865	3.50803	3.55099
4	1	2	A	29.7771	35.0119	35.2110	2.69815	2.87127	3.95161
5	1	2	B	30.8721	34.9414	34.1865	1.69193	4.09975	3.71486
6	1	2	C	29.1116	44.0786	26.8098	3.52212	3.34118	2.44389
7	1	3	A	30.5383	37.7909	31.6708	2.49286	2.15236	2.37052
8	1	3	B	32.8767	35.6612	31.4621	2.11591	4.27406	4.30061
9	1	3	C	29.2994	42.5460	28.1546	2.79356	3.26734	2.97060
10	1	4	A	29.9502	38.0482	32.0016	3.41172	4.08226	1.90535
11	1	4	B	31.6317	37.6250	30.7433	3.28543	5.64991	4.16696
12	1	4	C	30.8380	40.1870	28.9750	3.00335	4.19786	3.26911
13	1	5	A	31.2080	35.6229	33.1691	1.45580	3.50074	3.92145
14	1	5	B	32.1161	34.1038	33.7801	2.71366	3.39393	3.34036
15	1	5	C	30.4944	39.6581	29.8474	2.24933	3.14647	2.42695
16	1	6	A	31.9077	36.4266	31.6657	1.90131	1.86569	2.70882
17	1	6	B	32.7074	34.6848	32.6079	2.55806	2.87538	1.92663
18	1	6	C	30.1270	38.2515	31.6215	2.25501	2.09251	2.74588
19	1	7	A	30.1909	37.4911	32.3180	1.66251	3.34821	3.54005
20	1	7	B	30.6559	40.0880	29.2561	2.02927	4.53607	4.03240
21	1	7	C	31.7947	41.6026	26.6027	2.74449	2.65847	2.71853
22	1	8	A	30.9409	37.4783	31.5808	0.99848	1.33768	1.37781
23	1	8	B	32.0838	34.3309	33.5853	3.20321	5.89943	4.29130
24	1	8	C	31.8739	39.9310	28.1951	3.04341	3.22806	2.83008
25	1	9	A	32.6792	35.0867	32.2342	2.77719	2.54355	3.13482
26	1	9	B	33.6839	34.1096	32.2066	2.08177	3.75198	3.67460
27	1	9	C	32.3641	39.2405	28.3954	2.03562	2.25113	2.61337
28	1	10	A	32.4046	36.0149	31.5805	2.44817	3.34596	2.59639
29	1	10	B	32.5814	33.5186	33.8999	2.23566	3.98227	3.34762
30	1	10	C	32.8983	39.5949	27.5068	2.82171	2.91725	2.77646
31	1	11	A	31.6172	37.4670	30.9159	3.72700	3.48568	2.48910
32	1	11	B	33.6093	34.1341	32.2566	2.03816	2.96505	2.95237
33	1	11	C	33.6978	38.4990	27.8032	1.27307	2.21847	2.25873
34	1	12	A	32.4544	34.0478	33.4979	1.31846	3.65489	4.18808
35	1	12	B	32.9469	34.3987	32.6545	2.68947	3.71522	2.73796
36	1	12	C	32.0571	39.8697	28.0732	2.39880	1.69480	2.19688
37	1	13	A	31.1811	36.6948	32.1241	1.79918	1.94618	2.10465
38	1	13	B	31.6559	35.0909	33.2532	2.90821	3.86420	3.89616
39	1	13	C	33.5181	39.3249	27.1570	2.18885	2.56883	2.81238
40	1	14	A	32.0806	37.2545	30.6649	1.29093	0.83612	0.88185
41	1	14	B	32.1805	33.8440	33.9755	2.50255	3.50286	3.81032
42	1	14	C	32.6185	38.9967	28.3848	1.84062	2.55313	1.29039
43	1	15	A	31.3550	36.8403	31.8047	1.31878	1.06149	0.99447
44	1	15	B	32.7539	34.4541	32.7920	2.44592	4.41578	3.95400
45	1	15	C	33.5346	37.2283	29.2371	1.34609	2.09054	2.56089
46	1	16	A	31.5973	34.7842	33.6185	2.54638	4.73043	3.75005
47	1	16	B	33.0809	34.7370	32.1822	1.28568	3.74297	3.87662
48	1	16	C	31.4420	38.8380	29.7200	2.82752	3.10401	2.61724
49	1	17	A	30.7638	37.8513	31.3850	2.25798	3.33621	1.96833
50	1	17	B	32.7509	34.6271	32.6220	1.12320	3.95493	3.60530
51	1	17	C	32.2798	38.3313	29.3889	1.33429	2.90901	2.63435
52	1	18	A	31.2163	37.0072	31.7765	2.53872	3.88280	3.11680
53	1	18	B	32.9227	33.2158	33.8614	2.48484	3.15209	3.49960
54	1	18	C	32.4245	38.0564	29.5191	1.74937	1.74180	1.78424
55	1	19	A	31.6092	36.6919	31.6988	1.41771	2.53599	2.91624

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
56	1	19	B	31.9199	34.8105	33.2695	2.78061	3.95473	3.78421
57	1	19	C	33.7671	38.2091	28.0238	2.01567	2.45554	3.03144
58	1	20	A	31.6951	37.7669	30.5380	1.50478	1.17651	0.92040
59	1	20	B	32.6923	34.7369	32.5707	2.10650	4.90152	4.04813
60	1	20	C	33.3867	38.5815	27.5319	1.51784	1.37397	2.18727
61	1	21	A	32.9605	36.6140	30.4255	0.73012	2.65572	2.47239
62	1	21	B	32.4032	35.5472	32.0496	2.93192	5.15200	4.56667
63	1	21	C	32.9657	37.9113	29.1230	2.61144	4.54044	3.33469
64	1	22	A	32.5142	37.2527	30.2331	1.04470	0.73921	0.70691
65	1	22	B	31.8566	33.1068	35.0366	2.44399	4.65007	3.70831
66	1	22	C	32.5464	38.6800	28.7735	1.01826	2.23582	2.06647
67	1	23	A	32.2007	37.7000	30.0993	0.83976	0.83034	0.96894
68	1	23	B	30.5233	34.8049	34.6718	3.70287	3.85801	4.01913
69	1	23	C	31.8412	39.6718	28.4870	2.39125	2.35723	2.09012
70	1	24	A	32.5847	37.4498	29.9655	1.10576	0.84936	0.96669
71	1	24	B	33.0443	31.9245	35.0313	1.10188	3.75650	3.25402
72	1	24	C	32.9531	39.2351	27.8118	1.79122	3.25967	2.80898
73	1	25	E	31.7547	38.3202	29.9252	1.14305	0.87554	1.22670
74	1	26	G	31.3432	38.5040	30.1527	1.97033	1.48512	1.18586
75	1	27	D	31.7402	38.2889	29.9709	1.02751	1.12820	1.02952
76	1	28	F	31.7964	35.5990	32.6046	1.33254	3.09775	3.52993
77	1	29	D	31.2026	37.1797	31.6175	0.90188	3.27092	3.32737
78	1	30	F	32.3708	38.2747	29.3545	1.32567	0.84353	1.43849
79	1	31	E	31.1955	38.4710	30.3335	0.86687	0.56063	1.01144
80	1	32	G	31.2292	39.7142	29.0566	0.96802	1.55193	1.39330
81	2	1	A	33.4969	41.6670	24.8361	6.02081	5.73365	5.67527
82	2	1	B	30.0936	40.9002	29.0062	3.80947	3.62262	5.31771
83	2	1	C	32.4581	40.3165	27.2254	4.65224	3.61453	2.60682
84	2	2	A	26.9927	41.1069	31.9004	5.96386	5.82965	6.47850
85	2	2	B	29.3710	42.4627	28.1663	2.80099	3.95836	3.50583
86	2	2	C	28.9781	42.7855	28.2364	4.89845	2.87069	3.69460
87	2	3	A	29.6806	44.2488	26.0706	2.93475	4.38774	4.30047
88	2	3	B	30.9804	41.5534	27.4662	3.18042	3.81410	3.30452
89	2	3	C	29.4362	41.3535	29.2103	2.88125	2.62502	2.72211
90	2	4	A	27.5315	40.6558	31.8127	3.72616	3.89239	4.26289
91	2	4	B	28.8472	38.8808	32.2721	4.36843	2.69766	3.36881
92	2	4	C	29.1470	39.9900	30.8629	2.14557	2.56503	3.65460
93	2	5	A	26.7536	41.6199	31.6265	3.42906	3.67477	4.43297
94	2	5	B	26.7498	41.4720	31.7783	2.77570	3.32758	2.88519
95	2	5	C	30.0232	39.2713	30.7055	2.36639	1.89604	2.57614
96	2	6	A	24.8257	41.3948	33.7795	2.16942	3.15408	4.14186
97	2	6	B	26.8550	41.5452	31.5998	2.44754	4.00196	4.21019
98	2	6	C	28.7428	40.3706	30.8866	1.14163	2.53989	2.03439
99	2	7	A	27.6774	40.0498	32.2728	3.11207	3.67680	3.03138
100	2	7	B	27.1034	42.7402	30.1563	3.60333	3.30997	2.75145
101	2	7	C	27.6063	41.2544	31.1393	2.68952	4.40736	2.47347
102	2	8	A	30.4782	38.8101	30.7119	3.39850	3.07761	3.73895
103	2	8	B	27.8941	40.9185	31.1873	3.30497	4.15762	3.19619
104	2	8	C	27.9870	40.7404	31.2726	2.40239	3.26597	2.71834
105	2	9	A	26.1799	42.3520	31.4682	2.57777	3.81413	3.26408
106	2	9	B	27.9957	43.5608	28.4435	2.57699	4.53103	2.55896
107	2	9	C	29.3936	40.4333	30.1731	2.02954	2.29602	2.29799
108	2	10	A	22.7166	43.2203	34.0631	3.69427	5.12994	2.98726
109	2	10	B	27.8925	40.6948	31.4129	3.48088	4.70729	3.18830
110	2	10	C	29.8300	39.8695	30.3006	2.06901	2.36456	2.54441
111	2	11	A	25.7570	39.2436	34.9995	2.44790	4.27054	4.24295
112	2	11	B	27.8784	40.5109	31.6108	2.20983	3.73404	2.84601
113	2	11	C	28.5792	41.5611	29.8596	2.08815	1.59764	1.97224
114	2	12	A	24.4396	41.3161	34.2443	1.48838	3.15382	3.63524
115	2	12	B	27.7884	39.3178	32.8938	2.16440	2.85383	2.65346
116	2	12	C	30.1662	41.2022	28.6316	2.97496	2.07046	2.08604
117	2	13	A	28.1932	41.3746	30.4322	2.63032	2.80013	2.48577
118	2	13	B	28.2675	40.0455	31.6870	3.86456	3.94232	2.77822
119	2	13	C	27.0952	41.2525	31.6523	1.35118	2.91676	3.08233
120	2	14	A	24.6176	42.0663	33.3161	3.55007	3.04250	3.36346
121	2	14	B	29.4350	38.8483	31.7168	2.33484	3.47707	3.27770
122	2	14	C	28.8545	40.1367	31.0088	1.76060	2.00048	2.15752
123	2	15	A	24.4967	40.4464	35.0570	2.89400	2.12092	2.74397
124	2	15	B	28.1915	38.6113	33.1972	2.83379	3.48200	2.26206
125	2	15	C	29.6862	39.0905	31.2234	1.58846	2.37120	2.63775
126	2	16	A	23.9952	40.7793	35.2256	2.63145	3.04377	2.49831
127	2	16	B	25.7417	41.0362	33.2221	2.41632	2.98526	2.68550
128	2	16	C	29.0884	39.0991	31.8125	2.17691	1.47844	2.16674
129	2	17	A	22.7054	41.1675	36.1270	2.01577	3.61502	3.33759
130	2	17	B	27.6197	39.9828	32.3975	2.47016	3.04859	2.54842
131	2	17	C	27.9134	39.5227	32.5639	2.17134	1.88551	2.21505
132	2	18	A	23.4053	41.2843	35.3103	1.96210	3.98788	4.31743
133	2	18	B	27.8517	38.9432	33.2051	3.40242	4.24051	3.33977
134	2	18	C	29.1547	39.4934	31.3519	2.10938	2.69829	2.15175
135	2	19	A	25.8208	40.9906	33.1886	2.26824	1.91849	1.97100
136	2	19	B	27.9875	39.3729	32.6396	4.63083	5.07992	3.22839
137	2	19	C	29.7856	38.2720	31.9414	1.86987	3.06056	2.46477
138	2	20	A	24.9321	40.9090	34.1589	1.63096	2.17378	2.72028
139	2	20	B	29.2594	38.9073	31.8333	2.23629	2.73921	3.12435
140	2	20	C	29.7449	38.8699	31.3852	2.94802	3.25173	3.42269
141	2	21	A	25.8289	39.3258	34.8453	3.10278	3.78822	3.05586
142	2	21	B	28.4025	39.7709	31.8266	4.49415	5.19616	4.37943
143	2	21	C	28.7699	39.1513	32.0789	1.92443	2.25191	1.94771
144	2	22	A	25.7993	40.2006	34.0001	3.52907	3.85358	3.61975
145	2	22	B	26.2961	40.3307	33.3733	3.40571	2.88630	2.61606
146	2	22	C	27.3611	38.8684	33.7705	2.42146	3.07885	2.84421
147	2	23	A	25.9430	39.3881	34.6690	1.40367	3.45254	3.65235
148	2	23	B	26.9046	40.0211	33.0743	2.83708	3.80751	2.82828
149	2	23	C	28.3033	38.2477	33.4490	2.24175	2.74298	2.30525
150	2	24	A	25.6252	39.5020	34.8728	3.37836	2.82165	3.55777
151	2	24	B	27.6987	38.4853	33.8160	3.20847	3.12268	3.05311
152	2	24	C	29.7579	38.9038	31.3383	2.26144	2.79147	1.78152
153	2	25	E	28.9484	37.7628	33.2888	1.35085	1.91153	2.08681
154	2	26	G	29.0361	38.9540	32.0099	2.36686	2.78129	2.94998
155	2	27	D	26.2313	39.1206	34.6481	2.79952	3.23035	3.30447
156	2	28	F	30.0281	39.0856	30.8863	1.87546	1.83289	2.56456
157	2	29	D	25.6016	39.4744	34.9240	2.46265	2.72752	3.01962
158	2	30	F	28.0794	40.1366	31.7840	1.63354	1.29323	2.09917
159	2	31	E	28.1849	39.1844	32.6307	2.80055	2.63426	3.99136
160	2	32	G	30.6263	37.2208	32.1529	1.28435	2.05864	1.51255
161	3	1	A	33.8837	39.7861	26.3302	3.55730	6.40733	5.33320
162	3	1	B	31.9692	36.8182	31.2125	6.11801	3.74200	6.10745
163	3	1	C	26.2388	42.9346	30.8266	2.92513	4.94496	3.90746
164	3	2	A	20.5254	26.1073	53.3673	4.79368	3.25048	5.33989
165	3	2	B	23.9316	31.6300	44.4385	3.48482	3.11549	4.40268

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
166	3	2	C	25.1626	39.8902	34.9472	2.6012	2.73335	2.8224
167	3	3	A	19.0950	29.6671	51.2379	4.3781	4.55274	4.1276
168	3	3	B	22.3854	39.4169	38.1977	4.4156	3.65117	4.9546
169	3	3	C	23.8696	45.8955	30.2349	2.6216	3.46229	3.5192
170	3	4	A	29.3645	39.7800	30.8555	10.9271	5.12430	11.4185
171	3	4	B	36.8624	37.3552	25.7824	11.9871	5.50145	11.5380
172	3	4	C	26.5809	43.8626	29.5565	4.9209	5.12198	6.8805
173	3	5	A	26.8444	42.7680	30.3875	7.7889	6.82262	11.1075
174	3	5	B	30.5557	44.5339	24.9103	6.9573	6.70815	7.5694
175	3	5	C	25.5455	45.7523	28.7023	2.2792	2.65895	3.1510
176	3	6	A	29.4338	39.4842	31.0820	6.9463	4.48889	6.8156
177	3	6	B	30.8391	43.3103	25.8505	3.0743	3.47573	4.0623
178	3	6	C	28.8196	44.0064	27.1739	2.0791	2.45238	2.7819
179	3	7	A	23.6662	28.6485	47.6852	8.7712	3.71161	9.4638
180	3	7	B	31.0578	33.9194	35.0229	9.5377	3.23419	8.9235
181	3	7	C	25.4009	41.1431	33.4560	3.0637	2.86812	3.3835
182	3	8	A	44.9440	32.6064	22.4496	12.8957	5.38780	9.6211
183	3	8	B	40.3778	38.6777	20.9444	7.5380	4.55461	6.2126
184	3	8	C	31.6735	42.4907	25.8358	7.5827	4.04281	5.0632
185	3	9	A	49.6849	37.8531	12.4619	5.3990	4.60322	1.5078
186	3	9	B	42.1648	41.6694	16.1658	2.6850	3.21997	3.6317
187	3	9	C	36.4522	40.7432	22.8045	6.0733	3.56630	5.2916
188	3	10	A	47.5464	34.9110	17.5426	4.8484	5.02930	4.1366
189	3	10	B	43.6392	38.1288	18.2320	4.0702	3.39328	4.0357
190	3	10	C	37.6702	39.2056	23.1242	6.8449	3.60200	4.6305
191	3	11	A	48.3587	35.7184	15.9229	4.1870	4.34760	3.1135
192	3	11	B	45.6085	38.3630	16.0295	2.5313	2.75117	2.2565
193	3	11	C	40.4965	39.6511	19.8524	3.2502	3.70301	2.8111
194	3	12	A	52.2519	32.7218	15.0263	5.5633	5.62007	2.4047
195	3	12	B	44.4646	40.2120	15.3234	2.5511	2.69744	2.2118
196	3	12	C	41.3338	37.8229	20.8433	4.7422	3.93949	3.3179
197	3	13	A	44.6138	28.8240	26.5621	6.2659	3.93779	8.8947
198	3	13	B	37.1739	33.8904	28.9355	3.2045	4.42374	10.4033
199	3	13	C	33.2670	39.9799	26.7532	6.0831	2.85230	5.3674
200	3	14	A	48.9977	34.5328	16.4696	3.0612	3.29288	2.2826
201	3	14	B	45.5573	33.9014	20.5413	3.8740	3.09139	3.3057
202	3	14	C	37.3882	38.2454	23.8663	3.2661	4.16649	2.9611
203	3	15	A	52.9852	27.4091	19.6055	7.7355	7.85528	3.6835
204	3	15	B	50.7282	30.1824	19.0894	6.8036	5.60324	3.8418
205	3	15	C	40.5338	36.5045	22.9617	5.8475	3.65286	4.0627
206	3	16	A	55.8035	25.5746	18.6219	3.7315	4.28965	2.1061
207	3	16	B	48.3817	33.4416	18.1767	3.0399	3.36077	2.0432
208	3	16	C	46.7692	32.8518	20.3790	2.9625	2.79087	2.4236
209	3	17	A	54.5167	28.0910	17.3923	3.9602	4.81492	2.5820
210	3	17	B	49.3281	32.6276	18.0443	3.7542	4.58689	2.7048
211	3	17	C	44.5149	34.5355	20.9495	2.1238	2.82419	2.1836
212	3	18	A	55.3781	30.1009	14.5210	2.6261	2.97434	1.8222
213	3	18	B	51.8310	30.6776	17.4914	2.0583	1.84686	1.4068
214	3	18	C	45.7957	35.8631	18.3413	3.5451	3.57241	2.9449
215	3	19	A	56.8768	26.1965	16.9257	2.9586	2.94404	2.5294
216	3	19	B	51.3459	31.5163	17.1378	4.6104	4.35157	2.7876
217	3	19	C	44.7541	35.3425	19.9034	3.4990	2.37951	2.1299
218	3	20	A	56.6619	26.4071	16.9310	3.7526	5.29992	2.3025
219	3	20	B	51.2154	30.9783	17.8063	2.5727	3.03623	2.5903
220	3	20	C	46.3639	34.2828	19.3534	2.5522	2.04243	2.3869
221	3	21	A	55.8231	28.5494	15.6276	2.32529	2.97351	2.28476
222	3	21	B	52.4500	30.3883	17.1617	2.79826	2.75329	1.72516
223	3	21	C	45.8086	34.2386	19.9527	2.47355	2.78996	2.22000
224	3	22	A	56.7676	27.8918	15.3407	2.29366	2.92990	2.34093
225	3	22	B	52.7254	31.2042	16.0703	2.08404	2.28697	1.49948
226	3	22	C	46.2514	34.8424	18.9063	2.22142	3.00984	1.96774
227	3	23	A	54.0862	32.0963	13.8175	1.88716	3.17191	2.45146
228	3	23	B	51.3074	32.1326	16.5600	1.83915	3.13363	2.66202
229	3	23	C	46.3298	33.4656	20.2045	2.44731	2.02131	2.41640
230	3	24	A	54.3906	31.2307	14.3787	3.13340	4.02634	1.87638
231	3	24	B	52.0180	32.4530	15.5290	1.89955	2.10171	1.53137
232	3	24	C	46.4082	34.8212	18.7707	2.84420	2.55380	1.85994
233	3	25	E	53.4037	29.0385	17.5578	3.07193	1.73480	2.81212
234	3	26	G	49.0819	33.4188	17.4993	2.17600	2.21843	0.98773
235	3	27	D	55.6578	28.2801	16.0621	2.43177	3.29580	2.33202
236	3	28	F	50.1984	30.9007	18.9009	2.72447	2.75587	2.18099
237	3	29	D	52.9058	32.0194	15.0749	3.10692	4.49743	2.37382
238	3	30	F	50.6244	32.6411	16.7345	2.75669	3.69472	2.14201
239	3	31	E	50.3138	33.6812	16.0050	3.59371	4.52309	2.25174
240	3	32	G	46.8734	35.8642	17.2624	2.17382	2.54158	1.55137
241	4	1	A	32.4402	40.8176	26.7422	3.89597	2.85646	4.15554
242	4	1	B	32.1700	39.3795	28.4505	3.81208	3.47078	3.74098
243	4	1	C	30.7219	44.3087	24.9695	3.78494	2.94155	3.11449
244	4	2	A	31.4543	41.2690	27.2767	4.87625	3.52116	4.02764
245	4	2	B	31.6208	36.6013	31.7779	4.14816	5.70876	6.95651
246	4	2	C	32.4331	41.5464	26.0205	3.95715	4.06408	3.89059
247	4	3	A	27.7872	42.6195	29.5933	4.29309	6.55027	5.92363
248	4	3	B	29.4441	39.0395	31.5163	2.93066	4.95854	5.30659
249	4	3	C	31.9955	43.1056	24.8989	2.98435	3.43552	2.83249
250	4	4	A	28.6167	41.0803	30.3031	4.49239	6.22039	5.13422
251	4	4	B	29.1157	40.9022	29.9821	4.14447	4.37568	6.02601
252	4	4	C	30.9540	44.0727	24.9733	2.94250	3.75187	2.70239
253	4	5	A	29.6740	40.5791	29.7469	3.46714	3.08835	3.10105
254	4	5	B	29.7696	39.2669	30.9635	4.12796	4.37380	4.94697
255	4	5	C	31.2506	43.3931	25.3564	2.72714	2.64737	2.02676
256	4	6	A	30.6576	39.1388	30.2036	3.42827	2.74203	3.70693
257	4	6	B	31.5320	35.3452	32.0228	4.15700	5.91540	3.73409
258	4	6	C	32.7602	41.5216	25.7182	2.83823	2.59348	2.45249
259	4	7	A	30.5905	40.0622	29.3473	2.74056	3.83773	4.38088
260	4	7	B	32.0052	39.0419	28.9529	3.80812	4.37024	4.63044
261	4	7	C	34.3309	42.0937	23.5754	2.64200	2.14875	1.94848
262	4	8	A	28.4227	41.8737	29.7036	2.32156	2.93054	3.33672
263	4	8	B	27.1977	37.6937	35.1086	3.27741	4.60374	6.43129
264	4	8	C	30.3188	43.6693	26.0119	2.96719	3.87076	2.50288
265	4	9	A	28.3466	41.2288	30.4247	3.27051	3.58827	4.51618
266	4	9	B	29.2056	37.2389	33.5556	2.92879	5.43750	4.81670
267	4	9	C	29.0309	44.3159	26.6532	2.21745	2.56570	2.39429
268	4	10	A	28.4990	40.4790	31.0219	2.05793	4.18990	5.34705
269	4	10	B	30.0049	39.8293	30.1656	3.83563	6.04922	4.31727
270	4	10	C	29.8718	42.6034	27.5248	3.07013	3.11220	1.76079
271	4	11	A	29.5255	39.5162	30.9583	2.20795	2.80152	3.02379
272	4	11	B	30.2763	39.3423	30.3814	2.42472	3.70786	3.40469
273	4	11	C	30.1945	41.1400	28.6645	2.51966	2.56473	3.24991
274	4	12	A	29.0831	40.2619	30.6549	2.95629	3.95456	2.71174
275	4	12	B	30.4565	40.0785	29.4650	4.27681	5.39130	5.17406

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
276	4	12	C	29.5563	42.0217	28.4220	1.75771	2.43511	1.95585
277	4	13	A	30.2176	41.0913	28.6911	1.64302	2.05946	2.48985
278	4	13	B	31.1044	40.5657	28.3299	3.14020	3.27576	4.15184
279	4	13	C	31.0444	41.8058	27.1498	3.26290	3.68079	2.45996
280	4	14	A	29.1408	40.0272	30.8320	2.27808	2.64219	3.47781
281	4	14	B	30.5931	36.5492	32.8576	2.90099	5.71001	3.97826
282	4	14	C	31.5324	40.5897	27.8779	1.71581	2.74320	2.54931
283	4	15	A	29.5775	39.6270	30.7955	1.73618	3.55874	3.21425
284	4	15	B	30.7388	38.3219	30.9393	1.56751	4.27829	3.66573
285	4	15	C	31.2277	41.6030	27.1693	1.90904	1.86852	1.78305
286	4	16	A	30.4990	39.3748	30.1261	1.38537	1.87371	1.67280
287	4	16	B	31.1945	36.8823	31.9231	3.24555	4.39368	4.69903
288	4	16	C	30.1614	41.5971	28.2415	1.77526	1.92415	2.19461
289	4	17	A	28.4269	40.2792	31.2939	1.80395	2.49688	1.39481
290	4	17	B	29.8479	36.4141	33.7380	1.96353	4.44889	3.59214
291	4	17	C	30.2592	40.7598	28.9810	2.60133	3.19535	2.38665
292	4	18	A	28.8254	40.7196	30.4550	2.71914	2.41534	2.65901
293	4	18	B	29.2055	39.4666	31.3279	3.28622	4.99791	5.18463
294	4	18	C	30.1075	41.7227	28.1698	2.19539	2.75032	1.90202
295	4	19	A	28.9014	40.4817	30.6169	1.97588	0.93934	2.00745
296	4	19	B	28.7051	39.5823	31.7126	3.90019	3.89910	3.87163
297	4	19	C	30.9607	41.5378	27.5015	2.73912	2.65069	2.66333
298	4	20	A	29.8673	39.9471	30.1856	1.90633	1.18772	1.49676
299	4	20	B	30.9977	39.0752	29.9272	2.95743	3.81037	3.97117
300	4	20	C	32.3144	41.2547	26.4308	2.13160	1.62680	1.31854
301	4	21	A	29.2156	38.5804	32.2040	2.12573	2.48765	3.10896
302	4	21	B	29.2998	39.9298	30.7703	3.20393	4.10546	3.73227
303	4	21	C	31.0394	42.4933	26.4673	2.27957	1.72828	1.80960
304	4	22	A	29.2834	39.3915	31.3251	2.04064	2.39960	2.52484
305	4	22	B	30.1004	38.0995	31.8001	3.56434	5.35503	4.05095
306	4	22	C	32.4869	39.7156	27.7975	1.74478	2.33238	1.32307
307	4	23	A	29.1974	38.7091	32.0935	2.29229	4.07624	3.54619
308	4	23	B	31.3850	36.7664	31.8487	1.80831	3.63295	2.99361
309	4	23	C	31.8899	40.7893	27.3209	1.86759	2.05827	1.41062
310	4	24	A	29.6645	38.8805	31.4550	1.68728	3.03939	3.24032
311	4	24	B	31.0481	36.5626	32.3893	1.34738	3.77211	3.15180
312	4	24	C	31.9625	40.9297	27.1079	1.86216	2.12916	1.65722
313	4	25	E	29.4198	41.9543	28.6259	0.94956	2.01605	2.05882
314	4	26	G	31.5785	40.9379	27.4836	2.16153	2.54598	1.18861
315	4	27	D	25.3118	44.9612	29.7270	4.23193	4.23374	1.26243
316	4	28	F	30.7766	41.6043	27.6191	1.82111	2.70408	2.03228
317	4	29	D	25.9570	43.5402	30.5028	4.11434	5.26013	3.20430
318	4	30	F	29.9795	41.6819	28.3396	1.27168	1.55117	2.04351
319	4	31	E	29.3777	42.2124	28.4099	2.36494	3.05262	1.52257
320	4	32	G	32.8894	39.5435	27.5671	0.92937	0.84781	1.27482
321	5	1	A	31.3242	34.1554	34.5204	3.85882	2.63570	3.24108
322	5	1	B	27.9948	36.5689	35.4363	3.93238	2.93146	3.37278
323	5	1	C	28.4182	39.6370	31.9447	3.31459	4.23854	5.26025
324	5	2	A	30.5481	32.1947	37.2573	2.26531	2.49512	2.64083
325	5	2	B	30.1718	33.7071	36.1211	2.51142	2.94639	3.01374
326	5	2	C	29.3394	36.3626	34.2979	2.30727	3.49114	4.61958
327	5	3	A	30.5854	33.7307	35.6838	2.35843	2.35764	1.51800
328	5	3	B	30.1782	34.4076	35.4142	1.60878	1.68860	2.15947
329	5	3	C	29.2349	37.0073	33.7579	1.17774	1.80648	1.85934
330	5	4	A	32.8883	32.3089	34.8027	1.64587	1.87772	1.31496
331	5	4	B	30.8897	34.4005	34.7099	1.86088	2.32391	2.25483
332	5	4	C	31.4646	36.6440	31.8914	1.15167	1.84478	1.68293
333	5	5	A	32.1258	32.8832	34.9911	1.52856	1.55925	1.59013
334	5	5	B	31.3447	34.5844	34.0709	1.65727	1.69410	1.92073
335	5	5	C	31.4941	36.8364	31.6695	2.43601	1.74466	2.45149
336	5	6	A	30.1776	34.8581	34.9643	2.56122	2.70184	1.93208
337	5	6	B	30.3986	33.7893	35.8121	2.08031	2.05104	2.46624
338	5	6	C	30.9545	36.8045	32.2410	1.23909	1.87220	2.33636
339	5	7	A	30.2034	34.3186	35.4780	1.82071	1.78854	1.24955
340	5	7	B	30.5086	34.9786	34.5129	2.52289	2.61015	1.65723
341	5	7	C	31.3368	37.2655	31.3978	1.90938	2.37538	2.14663
342	5	8	A	31.8609	33.4767	34.6623	1.89675	2.05939	1.80936
343	5	8	B	31.9427	32.7735	35.2838	1.78652	2.48198	1.76219
344	5	8	C	31.7578	35.8304	32.4118	2.37197	2.22410	2.51646
345	5	9	A	31.6855	34.2425	34.0719	1.31664	1.92714	1.38119
346	5	9	B	32.7830	33.3971	33.8200	2.26336	2.75994	2.34934
347	5	9	C	32.2345	35.0467	32.7189	1.92971	1.78275	2.18330
348	5	10	A	31.3409	32.9090	35.7500	2.18703	1.46817	1.81765
349	5	10	B	29.6082	34.6564	35.7354	2.87175	2.25945	1.70710
350	5	10	C	28.5816	35.5416	35.8768	2.13951	1.61297	1.38478
351	5	11	A	30.1066	33.5348	36.3586	2.22378	2.05251	1.63421
352	5	11	B	29.4559	34.2736	36.2705	1.87944	2.37542	1.76205
353	5	11	C	28.9983	35.6279	35.3739	1.50506	1.74693	1.72895
354	5	12	A	29.9334	34.2236	35.8430	2.08484	1.81615	1.58845
355	5	12	B	30.8382	33.3433	35.8185	1.87016	1.99322	1.37836
356	5	12	C	28.3642	35.6763	35.9595	1.89862	2.31804	1.94228
357	5	13	A	32.9901	31.3751	35.6348	1.80257	1.48274	1.96788
358	5	13	B	32.6088	31.4160	35.9753	1.36487	2.10020	2.64874
359	5	13	C	30.3068	33.9614	35.7315	1.73068	2.08790	2.38430
360	5	14	A	30.6772	32.7623	36.5605	2.21789	2.04581	1.73406
361	5	14	B	30.1938	32.2003	37.6059	2.22685	1.62086	2.06710
362	5	14	C	28.9440	34.6737	36.3823	2.03661	1.50690	2.01383
363	5	15	A	28.9031	32.1782	38.9187	2.33597	2.64244	1.16425
364	5	15	B	29.5443	32.3470	38.1087	1.80738	2.39652	2.11579
365	5	15	C	28.5363	35.0964	36.3673	1.20650	2.23156	2.63964
366	5	16	A	30.8725	31.8605	37.2670	1.47064	1.83532	1.40407
367	5	16	B	29.7360	32.5975	37.6666	1.66076	1.89032	1.75569
368	5	16	C	28.3884	34.1975	37.4141	2.15444	2.05294	1.76593
369	5	17	A	29.9004	32.4573	37.6423	2.04607	1.60007	1.79430
370	5	17	B	29.5367	32.5719	37.8914	1.49366	2.09191	1.65589
371	5	17	C	27.6379	35.3307	37.0314	1.89480	1.39491	1.73117
372	5	18	A	27.9514	32.8125	39.2361	.	.	.
373	5	18	B	30.5504	29.9285	39.5211	1.00544	1.62352	1.33536
374	5	18	C	29.0329	32.4749	38.4922	1.74258	1.70261	1.79822
375	5	19	A	32.8221	31.4729	35.7050	1.46322	1.49373	1.52680
376	5	19	B	31.5783	31.6303	36.7914	1.83262	1.81849	1.79134
377	5	19	C	29.8574	34.2324	35.9102	2.20167	1.44284	2.42922
378	5	20	A	28.8209	33.1510	38.0281	2.23432	2.69764	2.29345
379	5	20	B	26.8120	32.4311	40.7569	2.61093	2.82703	3.26775
380	5	20	C	26.6230	33.8907	39.4862	1.76109	0.98300	1.46826
381	5	21	A	28.5051	33.9665	37.5284	1.97959	2.02397	2.40741
382	5	21	B	28.6016	33.4643	37.9341	3.21253	2.07597	3.04935
383	5	21	C	26.5706	34.0547	39.3747	1.93070	1.96644	2.45171
384	5	22	A	27.7737	34.0203	38.2060	2.03267	1.99181	1.93693
385	5	22	B	27.1965	34.0084	38.7951	2.13358	3.37534	2.45306

OBS	ID	BLOCK	TASK	RETM1	RETM2	RETM3	RETSD1	RETSD2	RETSD3
386	5	22	C	25.8917	33.8046	40.3036	1.32860	1.60393	1.58685
387	5	23	A	28.3113	33.1199	38.5689	1.66029	1.58120	2.35121
388	5	23	B	27.4944	35.6352	36.8704	2.48486	2.40914	2.32939
389	5	23	C	27.3901	33.5565	39.0534	1.04604	1.80842	1.58802
390	5	24	A	29.5743	33.6855	36.7402	1.91569	1.77781	1.99744
391	5	24	B	28.4651	34.7449	36.7900	1.95003	2.15182	1.86992
392	5	24	C	27.3723	35.3709	37.2568	1.12720	1.42350	1.57061
393	5	25	E	31.0552	31.9760	36.9688	1.21665	1.21025	1.57780
394	5	26	G	26.6737	33.2129	40.1135	1.81090	1.56424	2.50194
395	5	27	D	29.5325	32.6861	37.7813	1.71459	2.80367	2.97474
396	5	28	F	29.6073	31.6023	38.7904	2.09730	1.13136	2.21568
397	5	29	D	30.5572	34.3053	35.1375	1.87700	1.73243	2.26123
398	5	30	F	30.4652	34.7405	34.7942	1.15724	2.04927	1.71959
399	5	31	E	29.9572	34.3379	35.7049	1.47896	1.98809	1.55229
400	5	32	G	29.3820	33.9148	36.7032	1.38484	1.12518	1.80615
401	6	1	A	31.0503	40.3643	28.5854	2.22264	1.32184	2.26055
402	6	1	B	28.8118	39.2521	31.9251	4.54868	5.30811	4.12516
403	6	1	C	32.0146	42.4618	25.5236	3.17121	4.26695	4.15502
404	6	2	A	31.4155	41.3051	27.2794	1.22563	1.39016	1.88185
405	6	2	B	31.0986	39.8020	29.0994	2.48145	4.47746	4.36107
406	6	2	C	32.5879	43.0593	24.3529	2.56986	3.82903	3.54175
407	6	3	A	31.7385	40.2696	27.9919	2.02976	1.83796	2.72772
408	6	3	B	31.1535	36.2236	32.6228	2.45664	4.67232	5.09114
409	6	3	C	30.4472	40.8353	28.7175	3.74764	5.53395	4.03667
410	6	4	A	28.6221	39.6607	31.7172	1.94535	1.73819	2.54874
411	6	4	B	29.7749	36.9789	33.2461	5.32170	4.31253	5.34879
412	6	4	C	33.6483	40.2142	26.1376	3.31562	4.05771	2.96422
413	6	5	A	30.8713	37.9292	31.1995	3.21494	3.78045	4.57315
414	6	5	B	29.7972	38.2781	31.9247	3.81576	4.14509	4.82866
415	6	5	C	32.5984	40.8493	26.5523	3.49104	4.22609	4.71858
416	6	6	A	29.9121	39.3696	30.7183	5.25244	3.46563	3.79554
417	6	6	B	28.1733	37.5568	34.2700	4.41555	3.91565	5.29791
418	6	6	C	32.5644	43.0366	24.3990	4.07880	3.91204	4.16769
419	6	7	A	29.4665	40.7738	29.7597	1.77435	3.33305	3.38900
420	6	7	B	29.7743	38.1384	32.0874	1.94065	5.29063	4.93923
421	6	7	C	32.6082	42.0477	25.3441	2.82417	3.32092	2.58976
422	6	8	A	34.0547	36.0737	29.8716	3.71203	2.77277	4.33450
423	6	8	B	31.6157	36.7833	31.6011	3.35858	3.97699	4.74732
424	6	8	C	33.7243	40.2251	26.0506	2.73659	2.31368	4.45625
425	6	9	A	32.8946	36.8525	30.2529	2.84577	4.19374	4.00079
426	6	9	B	31.2682	36.6643	32.0675	3.72928	4.36214	5.15350
427	6	9	C	33.2068	41.3248	25.4683	2.19665	1.75833	2.75287
428	6	10	A	33.4185	38.0052	28.5763	2.34167	2.55801	3.20402
429	6	10	B	32.7299	37.5318	29.7383	3.38624	4.63113	4.44615
430	6	10	C	33.2782	40.9857	25.7361	2.71152	2.73637	3.44307
431	6	11	A	31.6909	42.7211	25.5880	4.18357	6.77405	3.88628
432	6	11	B	30.9481	40.4216	28.6303	4.53791	5.95433	6.74499
433	6	11	C	31.5404	46.8174	21.6422	3.20139	4.25856	2.62699
434	6	12	A	26.8137	50.4316	22.7546	3.34144	3.62454	3.10527
435	6	12	B	29.6547	47.7186	22.6257	2.79563	3.95511	3.07603
436	6	12	C	29.6916	49.8856	20.4228	3.11251	2.52123	1.45460
437	6	13	A	33.9204	37.4975	28.5821	2.89707	2.89789	3.05846
438	6	13	B	31.0262	40.5032	28.4706	3.14253	5.57554	4.07160
439	6	13	C	33.8617	39.8103	26.3281	2.69695	2.95773	2.77285
440	6	14	A	30.2058	45.3309	24.4633	5.92741	7.32279	2.39656
441	6	14	B	30.5281	44.7562	24.7157	4.45508	5.79521	3.24183
442	6	14	C	31.7884	44.7048	23.5068	4.14617	6.59985	4.11142
443	6	15	A	25.3318	50.3351	24.3331	2.33355	3.85910	4.24805
444	6	15	B	27.4317	50.7547	21.8136	1.33503	1.90212	1.36203
445	6	15	C	29.2035	49.7142	21.0823	3.18692	4.24121	2.50591
446	6	16	A	23.4614	51.9048	24.6338	2.72976	4.10804	3.66757
447	6	16	B	26.6294	50.1278	23.2427	3.54375	4.34015	2.63694
448	6	16	C	27.9957	50.0519	21.9524	2.78092	3.10577	2.31337
449	6	17	A	22.1045	56.6022	21.2933	3.75039	5.01556	2.62632
450	6	17	B	26.0963	51.5252	22.3785	2.37061	2.53679	2.10166
451	6	17	C	27.4190	52.3151	20.2659	2.33425	2.74827	2.33349
452	6	18	A	21.4008	57.2812	21.3180	1.58504	2.89258	2.66552
453	6	18	B	25.1512	52.0783	22.7705	1.64956	3.45309	2.66550
454	6	18	C	26.6620	52.6865	20.6515	2.26216	2.71961	1.73525
455	6	19	A	31.4312	41.4318	27.1370	4.47765	7.15307	3.57092
456	6	19	B	32.1798	44.2994	23.5207	4.08644	4.94965	1.91388
457	6	19	C	31.8888	45.5362	22.5750	2.99119	4.69108	3.31541
458	6	20	A	23.1768	55.5074	21.3156	2.09502	2.75309	1.78059
459	6	20	B	27.4729	52.6956	19.8315	1.76574	3.51653	2.42885
460	6	20	C	26.6313	50.9240	20.4447	2.13952	2.80061	1.59787
461	6	21	A	23.0521	54.4255	22.5224	3.13534	2.95349	2.11817
462	6	21	B	25.8555	51.9414	22.2032	3.55333	3.79896	2.20915
463	6	21	C	27.7989	50.7417	21.4593	1.38184	2.68789	2.37179
464	6	22	A	22.1332	56.5557	21.3111	3.45437	3.84670	1.99353
465	6	22	B	26.5193	52.7079	20.7727	2.98942	3.56536	2.11150
466	6	22	C	28.6762	50.4035	20.9203	1.74337	2.27886	1.68369
467	6	23	A	20.5685	59.3628	20.0687	2.09294	1.95237	1.74161
468	6	23	B	24.3736	53.9098	21.7166	2.58640	3.75142	2.32849
469	6	23	C	28.0049	50.6942	21.3010	2.73186	2.54620	2.17528
470	6	24	A	19.2835	60.8147	19.9018	2.31970	3.24405	2.67240
471	6	24	B	24.1930	54.4324	21.3745	2.21723	4.33170	2.95899
472	6	24	C	28.0818	51.4087	20.5095	1.87990	2.72174	1.94784
473	6	25	E	24.6770	49.7851	25.5379	1.14547	3.94490	4.38440
474	6	26	G	28.3580	47.5000	24.1420	2.21967	2.79507	1.72784
475	6	27	D	22.3689	50.5609	27.0702	1.82538	7.82790	7.60753
476	6	28	F	26.7956	49.6926	23.5118	1.95272	3.67906	3.50170
477	6	29	D	21.5922	54.5171	23.8907	3.66140	2.29914	3.21106
478	6	30	F	27.8455	48.5069	23.6476	2.56828	3.59786	5.26273
479	6	31	E	25.3261	49.4702	25.2037	2.85154	4.27781	5.92310
480	6	32	G	26.0179	46.7559	27.2262	2.43893	3.92116	4.39749

Appendix G

ANOVA Tables

Table 8

ANOVA Tables for Error Scores, Acquisition and Transfer, Experiment 1

	Source	df	SS	F	p
Acquisition					
AE					
	Subject	5	21109.19	18.11	.0001
	Block	24	50438.43	9.10	.0001
	Exemplar	2	1733.37	3.72	.03
	Bl x Ex	48	10119.19	.90	.65
	Subj x Bl	120	27711.60	.99	.52
	Error	250	58289.24	-	-
VE					
	Subject	5	25272.50	10.60	.0001
	Block	24	97673.44	8.11	.0001
	Exemplar	2	890.88	.93	.39
	Bl x Ex	48	18100.25	.79	.84
	Subj x Bl	120	60188.68	1.05	.37
	Error	250	119257.53	-	-
Transfer					
AE					
	Subject	5	28180.34	7.70	.0001
	Block	4	12083.58	4.13	.008
	Error	32	23426.09	-	-
VE					
	Subject	5	4643.60	5.38	.001
	Block	4	1153.54	1.67	.18
	Error	32	5523.01	-	-

Table 9

ANOVA Table for Relative Time Measures, Acquisition and Transfer, Experiment 1 (RelT=Relative Time for each Segment)

	Source	df	SS	F	p
Acquisition					
RelT(Seg 1)					
	Subject	5	419.61	47.13	.0001
	Block	24	97.55	.91	.59
	Exemplar	2	241.38	67.78	.0001
	Bl x Ex	48	49.95	.58	.99
	Subj x Bl	120	537.36	2.51	.0001
	Error	250	445.15	-	-
RelT(Seg 2)					
	Subject	5	1970.15	52.85	.0001
	Block	24	36.92	.17	1.00
	Exemplar	2	1932.52	129.60	.0001
	Bl x Ex	48	56.61	.16	1.00
	Subj x Bl	120	1085.46	1.21	.10
	Error	250	1863.94	-	-
RelT(Seg3)					
	Subject	5	1299.07	23.22	.0001
	Block	24	99.54	.78	.76
	Exemplar	2	3537.83	158.09	.0001
	Bl x Ex	48	44.94	.08	1.00
	Subj x Bl	120	638.20	.48	1.00
	Error	250	2797.29	-	-
Transfer					
RelT(Seg 1)					
	Subject	5	417.08	43.40	.0001
	Block	4	18.35	2.39	.07
	Error	32	61.51	-	-
RelT(Seg 2)					
	Subject	5	876.40	11.21	.0001
	Block	4	125.27	2.00	.12
	Error	32	500.46	-	-
RelT(Seg 3)					
	Subject	5	224.72	2.74	.04
	Block	4	148.80	2.27	.08
	Error	32	524.91	-	-

Table 10

ANOVA Table for Error Scores, Acquisition and Retention, Experiment 2

	Source	df	SS	F	p
Acquisition					
AE					
	Subject	5	52126.92	45.35	.0001
	Block	23	99160.54	14.48	.0001
	Exemplar	2	764.14	1.66	.19
	Bl x Ex	46	10408.97	.98	.51
	Subj x Bl	115	34248.61	1.30	.05
	Error	239	54942.03	-	-
VE					
	Subject	5	78538.47	55.00	.0001
	Block	23	152686.12	17.44	.0001
	Exemplar	2	2179.06	3.82	.02
	Bl x Ex	46	11966.95	.91	.64
	Subj x Bl	115	43765.12	1.33	.03
	Error	239	68251.92	-	-
Retention					
AE					
	Subject	5	16130.99	2.19	.07
	Block	8	138700.20	11.77	.0001
	Error	52	76579.29	-	-
VE					
	Subject	5	7240.48	5.13	.0007
	Block	8	6029.50	2.67	.02
	Error	52	14670.31	-	-

Table 11

ANOVA Table for Relative Time Measures, Acquisition and Retention, Experiment 2 (RelT=Relative Time for each Segment)

	Source	df	SS	F	p
Acquisition					
RelT(Seg 1)					
	Subject	5	8824.86	265.12	.0001
	Block	23	727.18	.48	.98
	Exemplar	2	12.19	.92	.40
	Bl x Ex	46	111.48	.36	1.00
	Subj x Bl	115	7534.10	9.84	.0001
	Error	240	1597.71	-	-
RelT(Seg 2)					
	Subject	5	6337.48	269.47	.0001
	Block	23	177.78	.21	1.00
	Exemplar	2	500.26	53.18	.0001
	Bl x Ex	46	185.18	.86	.73
	Subj x Bl	115	4196.34	7.76	.0001
	Error	240	1128.88	-	-
RelT(Seg 3)					
	Subject	5	7822.23	282.64	.0001
	Block	23	692.17	.64	.89
	Exemplar	2	383.65	34.66	.0001
	Bl x Ex	46	245.67	.96	.54
	Subj x Bl	115	5392.16	8.47	.0001
	Error	240	1328.43	-	-
Retention					
RelT(Seg 1)					
	Subject	5	4822.81	193.79	.0001
	Block	8	21.46	.54	.82
	Error	52	258.82	-	-
RelT(Seg 2)					
	Subject	5	2534.20	85.19	.0001
	Block	8	24.20	.51	.84
	Error	52	309.37	-	-
RelT(Seg 3)					
	Subject	5	2825.26	162.08	.0001
	Block	8	13.27	.48	.87
	Error	52	181.29	-	-

Appendix H

Preplanned Single Degree-of-Freedom Contrasts Results

Table 12

Preplanned Single Degree-of-Freedom Contrast for Experiment 1 (RelT=Relative Time for each Segment)

Contrast		df	SS	F	p
Block 25 (Acq) vs Transfer					
	AE	1	7685.35	10.50	.003
	VE	1	565.66	3.28	.08
	RelT(Seg 1)	1	5.74	2.99	.09
	RelT(Seg 2)	1	61.23	3.92	.06
	RelT(Seg 3)	1	29.48	1.80	.19
"Near" vs "Far"					
	AE	1	11.90	.02	.90
	VE	1	498.48	2.89	.10
	RelT(Seg 1)	1	.27	.14	.71
	RelT(Seg 2)	1	13.49	.86	.36
	RelT(Seg 3)	1	9.97	.61	.44

Table 13

Preplanned Single Degree-of-Freedom Contrasts for

Experiment 2 (RelT=Relative Time for each Segment)

Contrast	df	SS	F	p
Block 24 (Acq) vs 24-hr				
AE	1	16877.72	11.46	.001
VE	1	2037.74	7.22	.01
RelT(Seg 1)	1	.76	.15	.70
RelT(Seg 2)	1	10.31	1.73	.19
RelT(Seg 3)	1	5.46	1.57	.22
Block 24 (Acq) vs 1-wk				
AE	1	124088.71	84.26	.0001
VE	1	5360.28	19.00	.0001
RelT(Seg 1)	1	.01	.00	.99
RelT(Seg 2)	1	.01	.00	.98
RelT(Seg 3)	1	.01	.00	.96
Old vs New, 24-hr				
AE	1	593.02	.40	.53
VE	1	29.29	.10	.75
RelT(Seg 1)	1	1.16	.73	.63
RelT(Seg 2)	1	.04	.01	.93
RelT(Seg 3)	1	.76	.22	.64
Old vs New, 1-wk				
AE	1	14.73	.01	.92
VE	1	51.31	.18	.67
RelT(Seg 1)	1	.73	.15	.70
RelT(Seg 2)	1	1.84	.31	.58
RelT(Seg 3)	1	.25	.07	.79

Appendix I

Regression Analysis Results

Table 14

Results of Regression Analysis of Relative Time Measures on TMT by Subject for Experiment 1

Subject	Task Segment	Slope	t	p
1	1	.009	5.55	.0001
	2	-.009	-3.94	.0001
	3	-.0003	-0.17	.87
2	1	-.001	-0.36	.72
	2	-.007	-1.34	.18
	3	.009	1.78	.08
3	1	.000	.05	.96
	2	-.039	-6.67	.0001
	3	.039	5.95	.0001
4	1	.000	.26	.80
	2	-.01	-2.43	.02
	3	.01	2.08	.04
5	1	.012	8.89	.0001
	2	-.006	-4.32	.0001
	3	-.006	-4.18	.0001
6	1	-.002	-1.51	.13
	2	.008	4.11	.0001
	3	-.006	-3.12	.002

Table 15

Results of Regression Analysis of Relative Time Measures on TMT by Subject for Experiment 2

Subject	Task Segment	Slope	t	p
1	1	-.000	-0.00	1.00
	2	.002	1.02	.31
	3	-.002	-1.04	.30
2	1	.004	1.82	.07
	2	-.008	-4.28	.0001
	3	.005	2.42	.02
3	1	-.007	-1.97	.05
	2	.005	1.72	.09
	3	.002	.80	.43
4	1	.002	1.43	.15
	2	-.005	-2.40	.02
	3	.003	1.37	.17
5	1	.015	7.33	.0001
	2	-.009	-4.67	.001
	3	-.006	-2.53	.01
6	1	.006	2.69	.007
	2	-.009	-3.10	.002
	3	.003	1.36	.18

Appendix J

Newman-Keul's Pairwise Comparisons Results

Table 16

Follow-up Pairwise Comparisons of Main Effect for Blocks on AE (in Msec) for Experiment 1, Acquisition Phase

ALPHA=0.05 DF=120 MSE=230.93

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	10.0292	12.0212	13.1979	14.0298	14.6706	15.1911	15.6275	16.0028

NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	16.3315	16.6239	16.8863	17.1246	17.3426	17.5434	17.7293	17.9025

NUMBER OF MEANS	18	19	20	21	22	23	24	25
CRITICAL RANGE	18.0644	18.2165	18.3604	18.4958	18.6243	18.7455	18.863	18.9742

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BLOCK
A	85.574	19	1
B	68.857	19	4
B	67.241	19	2
B	66.799	19	3
C	53.625	19	6
C	53.250	19	7
C	52.846	18	8
C	51.254	19	19
C	50.482	19	11
C	49.420	18	13
C	49.261	19	25
C	48.987	19	9
C	47.890	19	5
C	47.882	19	10
C	46.990	18	21
C	45.571	19	12
C	44.893	19	23
C	43.791	19	14
C	43.624	19	20
C	42.811	19	24
C	42.051	19	16
C	41.824	19	17
C	40.981	19	15
C	40.537	19	22
C	40.451	19	18

Table 17

Follow-up Pairwise Comparisons of Main Effect for Blocks on VE (in Msec) for Experiment 1, Acquisition Phase

ALPHA=0.05 DF=120 MSE=501.572

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	14.7807	17.7163	19.4505	20.6760	21.6209	22.388	23.0312	23.5842
NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	24.0687	24.4996	24.8864	25.2376	25.5588	25.8547	26.1288	26.384
NUMBER OF MEANS	18	19	20	21	22	23	24	25
CRITICAL RANGE	26.6227	26.8468	27.0588	27.2584	27.4478	27.6279	27.7995	27.9634

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING				MEAN	N	BLOCK
		A		110.306	18	1
		B		81.508	18	4
C		B		79.479	18	3
C		B	D	70.994	18	2
C	E	B	D	65.954	18	6
C	E	B	D	65.361	18	19
C	E	B	D	65.051	18	7
C	E	B	D	64.746	18	8
C	E	B	D	61.243	18	9
C	E	B	D	60.785	18	13
C	E	B	D	58.345	18	5
C	E		D	56.320	18	10
C	E		D	55.109	18	11
	E		D	54.193	18	25
	E		D	51.475	18	12
	E		D	50.929	18	14
	E		D	50.810	18	21
	E		D	50.610	18	20
	E		D	49.456	18	16
	E		D	48.336	18	23
	E		D	48.324	18	17
	E		D	46.562	18	15
	E		D	45.457	18	18
	E			42.988	18	22
	E			40.686	18	24

Table 18

Follow-up Pairwise Comparisons of Main Effect for Exemplar on AE and VE (in Msec) for Experiment 1, Acquisition Phase

(Task A=Blue, B=White, C=Red)

AE

```
                ALPHA=0.05   DF=250   MSE=233.157

              NUMBER OF MEANS           2          3
              CRITICAL RANGE      3.47254    4.15719

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

      SNK        GROUPING               MEAN       N   TASK

                        A             53.491     150   A

                        B             49.342     150   B
                        B
                        B             49.314     150   C
```

VE

```
                ALPHA=0.05   DF=250   MSE=477.03

              NUMBER OF MEANS           2          3
              CRITICAL RANGE      4.96733    5.94632

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

      SNK        GROUPING               MEAN       N   TASK

                        A             60.368     150   A
                        A
                        A             58.141     150   B
                        A
                        A             57.347     150   C
```

Table 19

Follow-up Pairwise Comparison of Block x Exemplar Interaction on AE (in Msec) for Experiment 1, Acquisition Phase (Variable BXT: Number=Block, Letter=Exemplar- A= Blue, B=White, C=Red)

ALPHA=0.05 DF=250 MSE=233.157

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	17.3627	20.7859	22.8013	24.2244	25.3188	26.2052	26.9476	27.5862	28.145	28.6411	29.0867
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	29.4909	29.8605	30.2015	30.5161	30.809	31.0829	31.34	31.5823	31.8114	32.0285	32.235
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	32.4317	32.6194	32.7989	32.9708	33.1356	33.2938	33.4459	33.5922	33.7331	33.8697	34.0006
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	34.1272	34.2496	34.3682	34.4831	34.5946	34.7029	34.8083	34.9109	35.0109	35.1084	35.2037
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	35.2969	35.3881	35.4773	35.5648	35.6506	35.7348	35.8175	35.8987	35.9785	36.057	36.1341
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	36.21	36.2846	36.3581	36.4304	36.5015	36.5714	36.6403	36.7081	36.7747	36.8403	36.9048
NUMBER OF MEANS	68	69	70	71	72	73	74	75			
CRITICAL RANGE	36.9676	37.0301	37.0915	37.1519	37.2113	37.2697	37.3271	37.3835			

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK		GROUPING				MEAN	N	BXT
			A			96.198	6	1C
	B		A			90.189	6	1A
	B		A	C		75.265	6	2A
	B	D	A	C		74.590	6	4B
	B	D	A	C		74.439	6	3A
E	B	D	A	C		72.276	6	3C
E	B	D	A	C	F	70.334	6	1B
E	B	D		C	F	67.496	6	4A
E	B	D		C	F	64.485	6	4C
E	B	D		C	F	64.304	6	2C
E	B	D		C	F	63.005	6	6A
E	B	D		C	F	62.154	6	2B

SNK GROUPING				MEAN	N	BXT
E	D	C	F	58.707	6	19B
E	D	C	F	57.070	6	11A
E	D	C	F	56.857	6	8C
E	D	C	F	56.460	6	5A
E	D	C	F	55.582	6	7A
E	D	C	F	55.410	6	8A
E	D	C	F	54.928	5	13A
E	D	C	F	53.750	6	25B
E	D	C	F	53.683	5	3B
E	D	C	F	52.395	6	12B
E	D	C	F	52.309	6	10A
E	D	C	F	52.121	6	7B
E	D	C	F	52.046	5	7C
E	D	C	F	51.093	6	20A
E	D	C	F	51.051	5	11B
E	D	C	F	50.843	6	22A
E	D	C	F	50.641	5	19A
E	D	C	F	50.608	5	14B
E	D	C	F	50.570	6	6B
E	D	C	F	50.553	6	9C
E	D	C	F	49.778	5	24A
E	D	C	F	49.076	5	9B
E	D	C	F	49.017	5	25C
E	D	C	F	48.762	5	23C
E	D	C	F	48.676	5	21A
E	D	C	F	47.991	5	21B
E	D	C	F	47.331	5	9A
E	D	C	F	47.299	6	6C
E	D	C	F	47.245	6	16B
E	D	C	F	47.102	5	13C
E	D	C	F	47.051	6	10C
E	D	C	F	46.271	6	8B
E	D	C	F	46.230	6	13B
E	D	C	F	45.089	6	12A
E	D	C	F	45.081	6	5B
E	D	C	F	45.017	5	25A
E	D	C	F	44.415	6	19C
E	D	C	F	44.305	6	21C
E	D	C	F	44.285	6	10B
E	D	C	F	43.838	6	23A
E	D	C	F	43.324	6	11C
E	D	C	F	42.827	5	15B
E	D	C	F	42.390	6	17B
E	D	C	F	42.293	5	17C
E	D	C	F	42.228	6	12C
E	D	C	F	42.128	6	5C
E	D	C	F	42.079	6	23B
E	D	C	F	42.042	6	18A
E	D	C	F	41.584	6	20C
E	D	C	F	41.452	6	14A
E	D	C	F	41.333	6	16C
E	D	C	F	40.960	6	15A
E	D	C	F	40.789	6	17A
E	D	C	F	40.095	6	24C

SNK GROUPING			MEAN	N	BXT
D	C	F	39.710	5	18C
D	C	F	39.600	6	18B
D	C	F	39.312	6	14C
D	C	F	39.156	6	15C
D	C	F	38.560	6	24B
D	C	F	38.194	6	20B
D		F	37.576	5	16A
		F	37.008	6	22C
		F	33.759	5	22B

Table 20

Follow-up Pairwise Comparisons of Block x Exemplar Interaction on VE (in Msec) for Experiment 1, Acquisition Phase (Variable BXT: Number=Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=250 MSE=477.03

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	24.8351	29.7316	32.6143	34.6499	36.2153	37.4832	38.5451	39.4585	40.2577	40.9673	41.6049
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	42.183	42.7116	43.1993	43.6494	44.0683	44.4601	44.8278	45.1744	45.502	45.8127	46.108
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	46.3893	46.6578	46.9146	47.1604	47.3962	47.6225	47.84	48.0493	48.2508	48.4462	48.6335
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	48.8146	48.9897	49.1592	49.3236	49.4831	49.638	49.7887	49.9353	50.0785	50.2181	50.3544
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	50.4877	50.6181	50.7458	50.8709	50.9936	51.1141	51.2323	51.3485	51.4626	51.5749	51.6852
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	51.7937	51.9005	52.0056	52.1089	52.2106	52.3107	52.4092	52.5061	52.6015	52.6953	52.7876
NUMBER OF MEANS	68	69	70	71	72	73	74	75			
CRITICAL RANGE	52.8773	52.9667	53.0546	53.1411	53.226	53.3095	53.3916	53.4722			

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK	GROUPING		MEAN	N	BXT
	A		133.23	6	1C
	A				
B	A		110.06	6	1A
B					
B	C		98.20	6	3A
B	C				
B	C	D	88.22	6	4B
B	C	D			
B	C	D	87.63	6	1B
B	C	D			
B	C	D	82.04	6	4A
B	C	D			
B	C	D	78.67	6	6A
B	C	D			
B	C	D	78.53	6	2A
B	C	D			
B	C	D	76.88	6	19B
B	C	D			
B	C	D	74.27	6	4C
B	C	D			
B	C	D	73.76	6	3C
B	C	D			
B	C	D	72.82	6	8C

SNK GROUPING			MEAN	N	BXT
B	C	D	71.27	6	7B
B	C	D	67.64	6	2C
B	C	D	67.19	6	9C
B	C	D	66.90	6	5A
B	C	D	66.81	6	2B
B	C	D	66.48	6	3B
	C	D	64.32	6	13A
	C	D	63.59	6	7C
	C	D	63.43	6	8A
	C	D	63.13	5	6B
	C	D	61.34	6	11A
	C	D	60.77	6	10A
	C	D	60.30	6	7A
	C	D	60.23	5	13C
	C	D	59.89	6	19C
	C	D	59.68	6	9B
	C	D	59.31	5	19A
	C	D	57.98	5	8B
	C	D	57.80	6	13B
	C	D	57.29	5	5B
	C	D	56.86	6	9A
	C	D	56.71	5	25B
	C	D	56.55	6	14B
	C	D	56.19	5	25C
	C	D	56.06	6	6C
	C	D	55.36	5	10C
	C	D	55.69	6	16B
	C	D	55.43	6	12B
	C	D	54.83	6	21A
	C	D	54.33	6	20A
	C	D	53.17	6	11B
	C	D	52.67	6	23A
	C	D	52.34	6	10B
	C	D	51.77	6	22A
	C	D	50.85	6	21B
	C	D	50.81	6	11C
	C	D	50.08	5	12C
	C	D	49.94	6	5C
	C	D	49.68	6	14A
	C	D	49.68	6	25A
	C	D	49.52	5	17C
	C	D	49.50	6	20C
	C	D	49.31	6	17A
	C	D	49.17	6	15B
	C	D	48.91	6	12A
	C	D	48.85	6	18B
	C	D	48.13	6	16C
	C	D	48.00	6	20B
	C	D	47.49	6	23B
	C	D	46.74	6	21C
	C	D	46.55	6	14C
	C	D	46.15	6	17B
		D	45.56	6	15A
		D	45.55	6	18C

SNK GROUPING	MEAN	N	BXT
D	44.96	6	15C
D	44.85	6	23C
D	44.54	6	16A
D	42.11	6	24C
D	41.98	6	18A
D	40.21	5	22B
D	40.20	6	24A
D	39.75	5	24B
D	36.68	6	22C

Table 21

Follow-up Pairwise Comparisons of Main Effect for Block on Relative Time, Segment 1 (in Percent) for Experiment 1, Acquisition Phase

ALPHA=0.05 DF=120 MSE=4.47802

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	1.3966	1.67398	1.83784	1.95368	2.04292	2.11539	2.17617	2.22843
NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	2.2742	2.31492	2.35147	2.38464	2.415	2.44296	2.46885	2.49297
NUMBER OF MEANS	18	19	20	21	22	23	24	25
CRITICAL RANGE	2.51552	2.5367	2.55673	2.57559	2.59349	2.6105	2.62672	2.64221

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BLOCK
A	30.5645	18	1
A	30.1818	18	2
A	29.9434	18	7
A	29.9212	18	13
A	29.8405	18	4
A	29.7311	18	6
A	29.6730	18	12
A	29.6542	18	5
A	29.4332	18	11
A	29.4240	18	8
A	29.4215	18	16
A	29.4193	18	21
A	29.3509	18	3
A	29.3231	18	18
A	29.2681	18	17
A	29.2618	18	19
A	29.2254	18	10
A	29.2044	18	9
A	29.1702	18	20
A	29.1590	18	14
A	29.0313	18	15
A	28.8828	18	23
A	28.8222	18	22
A	28.7395	18	25
A	28.3791	18	24

Table 22

Follow-up Pairwise Comparisons of Main Effect for Block on Relative Time, Segment 2 (in Percent) for Experiment 1, Acquisition Phase

ALPHA=0.05 DF=120 MSE=9.0455

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	1.98493	2.37916	2.61204	2.77669	2.90352	3.00652	3.0929	3.16717
NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	3.23222	3.2901	3.34204	3.3892	3.43234	3.47207	3.50888	3.54315
NUMBER OF MEANS	18	19	20	21	22	23	24	25
CRITICAL RANGE	3.5752	3.60531	3.63378	3.66058	3.68601	3.7102	3.73325	3.75526

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BLOCK
A	40.715	18	24
A	40.691	18	3
A	40.566	18	23
A	40.551	18	20
A	40.530	18	22
A	40.435	18	4
A	40.310	18	2
A	40.252	18	1
A	40.209	18	19
A	40.188	18	8
A	40.121	18	18
A	40.111	18	14
A	40.098	18	7
A	40.068	18	10
A	40.061	18	5
A	40.030	18	25
A	40.021	18	17
A	40.018	18	15
A	39.949	18	13
A	39.905	18	21
A	39.848	18	9
A	39.845	18	16
A	39.781	18	11
A	39.749	18	12
A	39.714	18	6

Table 23

Follow-up Pairwise Comparisons of Main Effect for Block on Relative Time, Segment 3 (in Percent) for Experiment 1, Acquisition Phase

ALPHA=0.05 DF=120 MSE=5.3183

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	1.522	1.82429	2.00286	2.12911	2.22635	2.30534	2.37157	2.42852

NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	2.4784	2.52278	2.56261	2.59876	2.63185	2.66231	2.69054	2.71681

NUMBER OF MEANS	18	19	20	21	22	23	24	25
CRITICAL RANGE	2.74139	2.76447	2.7863	2.80686	2.82636	2.8449	2.86258	2.87946

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BLOCK
A	31.2301	18	25
A	30.9512	18	15
A	30.9477	18	9
A	30.9063	18	24
A	30.7855	18	11
A	30.7330	18	16
A	30.7300	18	14
A	30.7111	18	17
A	30.7069	18	10
A	30.6760	18	21
A	30.6477	18	22
A	30.5780	18	12
A	30.5562	18	18
A	30.5544	18	6
A	30.5510	18	23
A	30.5258	18	19
A	30.3882	18	8
A	30.2843	18	5
A	30.2793	18	20
A	30.1302	18	13
A	29.9590	18	7
A	29.9581	18	3
A	29.7249	18	4
A	29.5081	18	2
A	29.1831	18	1

Table 24

Follow-up Pairwise Comparisons of Main Effect for Exemplar on Relative Time, Segments 1, 2, and 3 (in Percent) for Experiment 1, Acquisition Phase (Task: A=Blue, B=White, C=Red)

Relative Time, Segment 1

ALPHA=0.05 DF=250 MSE=1.78058

NUMBER OF MEANS	2	3
CRITICAL RANGE	0.303462	0.363293

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	TASK
A	30.4291	150	C
B	28.9963	150	A
B			
B	28.7777	150	B

Relative Time, Segment 2

ALPHA=0.05 DF=250 MSE=7.45576

NUMBER OF MEANS	2	3
CRITICAL RANGE	0.620969	0.743398

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	TASK
A	43.0746	150	C
B	38.8608	150	A
B			
B	38.5165	150	B

Relative Time, Segment 3

ALPHA=0.05 DF=250 MSE=11.1892

NUMBER OF MEANS	2	3
CRITICAL RANGE	0.760715	0.910698

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	TASK
A	32.7059	150	B
A			
A	32.1428	150	A
B	26.4964	150	C

Table 25

Follow-up Pairwise Comparisons of the Block x Exemplar Interaction on Relative Time, Segment 1 (in Percent) for Experiment 1, Acquisition Phase (Variable BXT: Number= Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=250 MSE=1.78058

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	1.51731	1.81646	1.99258	2.11695	2.21259	2.29005	2.35493	2.41073	2.45956	2.50292	2.54186
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	2.57719	2.60948	2.63928	2.66677	2.69237	2.7163	2.73877	2.75995	2.77996	2.79894	2.81698
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	2.83417	2.85058	2.86626	2.88129	2.89569	2.90951	2.9228	2.93559	2.9479	2.95984	2.97128
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	2.98234	2.99304	3.0034	3.01344	3.02319	3.03265	3.04186	3.05083	3.05957	3.06809	3.07642
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	3.08456	3.09253	3.10033	3.10798	3.11548	3.12283	3.13006	3.13716	3.14413	3.15099	3.15773
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	3.16436	3.17088	3.1773	3.18361	3.18983	3.19594	3.20196	3.20788	3.21371	3.21944	3.22508
NUMBER OF MEANS	68	69	70	71	72	73	74	75			
CRITICAL RANGE	3.23056	3.23602	3.24139	3.24667	3.25186	3.25696	3.26198	3.26691			

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK	GROUPING				MEAN	N	BXT
			A		32.0195	6	2C
			A				
	B		A		31.6312	6	4C
	B		A				
	B		A	C	31.3577	6	1C
	B		A	C			
	B	D	A	C	31.2536	6	7C
	B	D	A	C			
E	B	D	A	C	31.0228	6	6C
E	B	D	A	C			
E	B	D	A	C	30.9548	6	8C
E	B	D	A	C			
E	B	D	A	C	30.8962	6	5C
E	B	D	A	C			
E	B	D	A	C	30.7475	6	12C
E	B	D	A	C			
E	B	D	A	C	30.4377	6	3C
E	B	D	A	C			
E	B	D	A	C	30.3911	6	11C
E	B	D	A	C			
E	B	D	A	C	30.3543	6	13C
E	B	D	A	C			
E	B	D	A	C	30.3455	6	16C

SNK GROUPING					MEAN	N	BXT
E	B	D	A	C	30.3156	6	18C
E	B	D	A	C	30.2896	6	17C
E	B	D	A	C	30.2393	6	1B
E	B	D	A	C	30.1613	6	9C
E	B	D	A	C	30.1200	6	14C
E	B	D	A	C	30.1065	6	15C
E	B	D	A	C	30.0997	6	19C
E	B	D	A	C	30.0965	6	1A
E	B	D	A	C	30.0886	6	10C
E	B	D	A	C	30.0314	6	20C
E	B	D	A	C	29.8589	6	22C
E	B	D	A	C	29.8011	6	23C
E	B	D	A	C	29.7438	6	21C
E	B	D	A	C	29.7333	6	13A
E	B	D	A	C	29.6760	6	13B
E	B	D	A	C	29.6591	6	7A
E	B	D	A	C	29.5712	6	21B
E	B	D	A	C	29.5571	6	3A
E	B	D	A	C	29.4804	6	9A
E	B	D	A	C	29.4242	6	2A
E	B	D	A	C	29.3847	6	25C
E	B	D	A	C	29.3539	6	6A
E	B	D	A	C	29.3305	6	11A
E	B	D	A	C	29.3135	6	24C
E	B	D	A	C	29.2808	6	12A
E	B	D	A	C	29.1486	6	10A
E	B	D	A	C	29.1461	6	4A
E	B	D	A	C	29.1444	6	18B
E	B	D	A	C	29.1196	5	5B
E	B	D	A	C	29.1016	6	2B
E	B	D	A	C	29.0237	5	19A
E	B	D	A	C	29.0114	6	14A
E	B	D	A	C	28.9905	6	12B
E	B	D	A	C	28.9817	6	16A
E	B	D	A	C	28.9468	6	5A
E	B	D	A	C	28.9433	6	17B
E	B	D	A	C	28.9428	5	21A
E	B	D	A	C	28.9375	6	16B
E	B	D	A	C	28.9268	5	20B
E	B	D	A	C	28.9176	6	7B
E	B	D	A	C	28.9061	6	8A
E	B	D		C	28.8165	6	6B
E	B	D		C	28.7443	6	4B
E	B	D		C	28.6621	6	19B
E	B	D		C	28.6358	6	15B
E	B	D		C	28.5941	6	22B
E	B	D		C	28.5781	6	11B
E	B	D		C	28.5715	6	17A
E	B	D		C	28.5525	6	20A
E	B	D		C	28.5231	6	25A
E	B	D		C	28.5094	5	18A
E	B	D		C	28.4417	6	23A
E	B	D		C	28.4389	5	10B
E		D		C	28.4111	6	8B

SNK	GROUPING		MEAN	N	BXT
E	D	C	28.4057	6	23B
E	D	C	28.3516	6	15A
E	D	C	28.3455	6	14B
E	D	C	28.3106	6	25B
E	D		28.0580	6	3B
E			28.0137	6	22A
E			27.9714	6	9B
E			27.9221	6	24A
E			27.9019	6	24B

Table 26

Follow-up Pairwise Comparisons of the Block x Exemplar Interaction on Relative Time, Segment 2 (in Percent) for Experiment 1, Acquisition Phase (Variable BXT: Number= Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=250 MSE=7.45576

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	3.10484	3.71699	4.07738	4.33186	4.52757	4.68608	4.81883	4.93303	5.03295	5.12166	5.20136
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	5.27364	5.33972	5.4007	5.45696	5.50934	5.55831	5.60429	5.64762	5.68858	5.72742	5.76434
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	5.79951	5.83308	5.86518	5.89591	5.92538	5.95368	5.98087	5.00703	6.03223	6.05665	6.08009
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	6.10271	6.1246	6.14579	6.16634	6.18628	6.20565	6.2245	5.24284	6.26072	6.27817	6.29521
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	6.31188	6.32818	6.34414	6.35979	6.37513	6.39019	6.40497	5.41949	6.43376	6.44779	6.46159
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	6.47516	6.48851	6.50164	6.51456	6.52728	6.53979	6.55211	5.56422	6.57614	6.58787	6.59941
NUMBER OF MEANS	68	69	70	71	72	73	74	75			
CRITICAL RANGE	6.61063	6.6218	6.63279	6.6436	6.65422	6.66466	6.67492	6.685			

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BXT
A	43.700	6	25C
A	43.598	6	24C
A	43.592	6	20C
A	43.542	6	3C
A	43.434	6	22C
A	43.344	6	11C
A	43.336	6	19C
A	43.297	6	23C
A	43.229	6	5C
A	43.221	6	17C
A	43.215	6	21C
A	43.203	6	15C

SNK GROUPING	MEAN	N	BXT
A	43.190	6	16C
A	43.178	6	18C
A	43.082	6	7C
A	43.059	6	12C
A	42.856	6	14C
A	42.847	6	8C
A	42.781	6	10C
A	42.718	6	13C
A	42.570	6	4C
A	42.557	6	1C
A	42.507	6	6C
A	42.504	6	9C
A	42.307	6	2C
A	39.793	6	3B
A	39.571	6	20A
A	39.476	6	2A
A	39.443	6	23B
A	39.419	6	24A
A	39.369	6	4B
A	39.365	6	4A
A	39.336	6	1A
A	39.212	6	22A
A	39.148	5	2B
A	39.127	6	24B
A	39.041	6	18A
A	39.025	6	8A
A	38.982	6	10A
A	38.959	5	23A
A	38.945	6	22B
A	38.909	5	15A
A	38.865	6	1B
A	38.852	5	13A
A	38.812	6	12A
A	38.799	6	17A
A	38.793	6	21A
A	38.779	6	19B
A	38.773	6	7A
A	38.752	6	14B
A	38.743	6	5A
A	38.738	5	3A
A	38.726	6	14A
A	38.691	5	8B
A	38.568	6	9B
A	38.514	5	19A
A	38.488	6	20B
A	38.472	6	9A
A	38.440	6	10B
A	38.438	6	7B
A	38.405	6	25A
A	38.364	6	6A
A	38.276	5	13B
A	38.273	5	6B
A	38.222	6	16A
A	38.213	5	5B

SNK GROUPING	MEAN	N	BXT
A	38.143	6	18B
A	38.124	6	16B
A	38.043	6	17B
A	38.013	6	11A
A	37.987	6	11B
A	37.986	6	25B
A	37.941	6	15B
A	37.706	6	21B
A	37.376	6	12B

Table 27

Follow-up Pairwise Comparisons of the Block x Exemplar Interaction on Relative Time, Segment 3 (in Percent) for Experiment 1, Acquisition Phase (Variable BXT: Number= Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=250 MSE=11.1892

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	3.80358	4.55349	4.99497	5.30673	5.54648	5.74067	5.90329	6.0432	6.1656	6.27427	6.3719
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	6.46045	6.54141	6.61611	6.68503	6.7492	6.80919	6.86552	6.9186	6.96878	7.01635	7.06158
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	7.10466	7.14579	7.18511	7.22277	7.25887	7.29353	7.32684	7.35889	7.38976	7.41968	7.44837
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	7.4761	7.50292	7.52888	7.55405	7.57848	7.60221	7.6253	7.64777	7.66968	7.69105	7.71193
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	7.73234	7.75231	7.77187	7.79103	7.80983	7.82828	7.84639	7.86418	7.88166	7.89885	7.91575
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	7.93237	7.94872	7.96481	7.98064	7.99622	8.01155	8.02663	8.04148	8.05608	8.07045	8.08459
NUMBER OF MEANS	68	69	70	71	72	73	74	75			
CRITICAL RANGE	8.09833	8.11202	8.12548	8.13871	8.15173	8.16451	8.17708	8.18944			

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BXT
A	33.703	6	25B
A	33.634	6	12B
A	33.461	6	9B
A	33.435	6	11B
A	33.423	6	15B
A	33.121	6	10B
A	33.072	6	25A
A	33.014	6	17B
A	32.971	6	24B
A	32.938	6	16B
A	32.910	6	6B
A	32.903	6	14B

SNK GROUPING	MEAN	N	BXT
A	32.898	6	8B
A	32.796	6	16A
A	32.774	6	22A
A	32.740	6	15A
A	32.723	6	21B
A	32.712	6	18B
A	32.668	6	5B
A	32.659	6	24A
A	32.657	6	11A
A	32.645	6	7B
A	32.630	6	17A
A	32.599	6	23A
A	32.585	6	20B
A	32.559	6	19B
A	32.462	6	19A
A	32.461	6	22B
A	32.450	6	18A
A	32.310	6	5A
A	32.283	6	6A
A	32.264	6	21A
A	32.263	6	14A
A	32.152	6	23B
A	32.149	6	3B
A	32.069	6	8A
A	32.048	6	13B
A	32.048	6	9A
A	31.907	6	12A
A	31.887	6	4B
A	31.876	5	20A
A	31.869	5	10A
A	31.751	5	2B
A	31.705	5	3A
A	31.568	6	7A
A	31.489	6	4A
A	31.415	6	13A
A	31.100	6	2A
A	30.896	6	1B
A	30.567	6	1A
A	27.335	5	9C
A	27.130	6	10C
A	27.089	6	24C
A	27.041	6	21C
A	27.024	6	14C
A	26.925	6	13C
A	26.916	6	25C
A	26.902	6	23C
A	26.708	6	22C
A	26.691	6	15C
A	26.565	6	19C
A	26.507	6	18C
A	26.490	6	17C
A	26.470	6	6C
A	26.465	5	16C
A	26.376	6	20C

SNK GROUPING	MEAN	N	BXT
A	26.265	6	11C
A	26.198	6	8C
A	26.194	6	12C
A	26.086	6	1C
A	26.021	6	3C
A	25.875	6	5C
A	25.799	6	4C
A	25.674	6	2C
A	25.665	6	7C

Table 28

Follow-up Pairwise Comparisons of Main Effect for Block on AE (in Msec) for Experiment 2, Acquisition Phase

ALPHA=0.05 DF=115 MSE=297.814

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=17.956

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	11.4084	13.6756	15.0153	15.9626	16.6925	17.2852	17.7823	18.2098

NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	18.5849	18.9174	19.2164	19.4879	19.7363	19.9651	20.1771	20.3744

NUMBER OF MEANS	18	19	20	21	22	23	24
CRITICAL RANGE	20.559	20.7323	20.8961	21.0506	21.197	21.3363	21.4691

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BLOCK
A	102.534	18	1
B	85.478	18	4
B	83.396	18	2
C B	79.411	18	3
C B D	70.531	18	5
C B D	69.603	18	7
C E D	65.057	18	9
C F E D	62.532	18	8
F E D	61.382	18	10
F E D	58.090	18	11
F E D	56.408	18	19
F E D	56.394	18	6
F E D	55.573	18	17
G F E D	53.551	18	15
G F E D	52.725	18	12
G F E D	52.126	18	16
G F E D	51.981	18	13
G F E	49.648	18	20
G F E	48.922	18	21
G F E	48.225	18	14
G F E	46.069	18	22
G F	44.376	18	23
G F	42.402	17	18
G	36.355	18	24

Table 29

Follow-up Pairwise Comparisons of Main Effect for Block on VE (in Msec) for Experiment 2, Acquisition Phase

ALPHA=0.05 DF=115 MSE=380.566

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=17.956

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	12.8964	15.4593	16.9737	18.0446	18.8696	19.5396	20.1016	20.5849

NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	21.0089	21.3847	21.7228	22.0297	22.3105	22.5691	22.8087	23.0318

NUMBER OF MEANS	18	19	20	21	22	23	24
CRITICAL RANGE	23.2404	23.4364	23.6216	23.7961	23.9617	24.1192	24.2692

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING				MEAN	N	BLOCK
		A		125.267	18	1
		B		100.740	18	4
		B		93.070	18	2
		B		92.532	18	3
C		B		86.680	18	5
C		D		75.252	18	7
C		D		74.914	18	9
C		D	E	72.355	18	8
C		D	E	71.874	18	10
C		D	E	70.661	18	19
C	F	D	E	67.187	18	6
	F	D	E	66.564	18	11
	F	D	E	63.930	18	13
	F	D	E	62.523	18	17
G	F	D	E	60.862	18	12
G	F	D	E	59.982	18	16
G	F	D	E	59.810	18	20
G	F	D	E	59.582	18	21
G	F	D	E	59.141	18	15
G	F	D	E	54.953	18	14
G	F		E	51.993	18	22
G	F			47.932	18	23
G	F			46.221	17	18
G				40.039	18	24

Table 30

Follow-up Pairwise Comparisons of Main Effect for Exemplar on AE and VE (in Msec) For Experiment 2, Acquisition Phase

AE

```
                    ALPHA=0.05  DF=239  MSE=229.884
               WARNINGO CELL SIZES ARE NOT EQUAL.
                        HARMONIC MEAN OF CELL SIZES=143.665
                  NUMBER OF MEANS          2          3
                  CRITICAL RANGE     3.52408     4.2191
MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.
      SNK        GROUPING              MEAN        N   TASK
                        A            61.610      143   A
                        A
                        A            59.270      144   B
                        A
                        A            58.224      144   C
```

VE

```
                    ALPHA=0.05  DF=239  MSE=285.573
               WARNINGO CELL SIZES ARE NOT EQUAL.
                        HARMONIC MEAN OF CELL SIZES=143.665
                  NUMBER OF MEANS          2          3
                  CRITICAL RANGE      3.9278    4.70245
MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.
      SNK        GROUPING              MEAN        N   TASK
                        A            71.308      143   A
                        A
                        A            70.748      144   B

                        B            66.125      144   C
```

Table 31

Follow-up Pairwise Comparisons of the Block x Exemplar Interaction for AE (in Msec) for Experiment 2, Acquisition (Variable BXT: Number=Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=239 MSE=229.884

WARNINGO CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=5.98338

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	17.2682	20.6739	22.6791	24.0952	25.1844	26.0666	26.8055	27.4411	27.9972	28.491	28.9346
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	29.337	29.7049	30.0442	30.3575	30.6491	30.9218	31.1778	31.419	31.6471	31.8633	32.0688
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	32.2647	32.4516	32.6303	32.8015	32.9656	33.1231	33.2745	33.4202	33.5613	33.6964	33.8268
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	33.9529	34.0748	34.1928	34.3073	34.4183	34.5262	34.6311	34.7333	34.8329	34.93	35.0249
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	35.1177	35.2085	35.2974	35.3846	35.47	35.5539	35.6362	35.7171	35.7966	35.8747	35.9515
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	36.0271	36.1014	36.1746	36.2466	36.3174	36.3871	36.4557	36.5232	36.5896	36.6541	36.7185
NUMBER OF MEANS	68	69	70	71	72						
CRITICAL RANGE	36.7818	36.844	36.9052	36.9654	37.0245						

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

```
SNK     GROUPING                  MEAN     N  BXT

                  A            114.552     6  1A
                  A
         B        A            100.805     6  1B
         B        A
         B        A     C       92.243     6  1C
         B        A     C
         B        A     C       92.154     6  3A
         B        A     C
         B    D   A     C       90.484     6  2A
         B    D   A     C
    E    B    D   A     C       89.777     6  4A
    E    B    D   A     C
    E    B    D   A     C F     88.715     6  4B
    E    B    D          C F
    E    B    D   G     C F     81.502     6  2B
    E    B    D   G     C F
    E    B    D   G   H C F     80.454     6  7A
    E    B    D   G   H C F
    E    B    D I G   H C F     78.202     6  2C
```

SNK GROUPING	MEAN	N	BXT
E B J D I G H C F	77.942	6	4C
E B J D I G H C F	77.812	6	5A
E K B J D I G H C F	76.449	6	3C
E K B J D I G H C F	73.919	6	5B
L E K B J D I G H C F	71.344	6	9A
L E K B J D I G H C F	71.047	6	7C
L E K M J D I G H C F	68.139	6	8C
L E K M J D I G H C F	66.632	6	3B
L E K M J D I G H C F	66.381	6	9C
L E K M J D I G H C F	65.830	6	10B
L E K M J D I G H C F	61.864	6	11B
L E K M J D I G H C F	61.597	6	8B
L E K M J D I G H C F	60.978	6	6C
L E K M J D I G H C F	60.451	6	13A
L E K M J D I G H F	60.044	6	10A
L E K M J D I G H F	59.862	6	5C
L E K M J D I G H F	59.467	6	19B
L E K M J D I G H F	58.485	6	19C
L E K M J D I G H F	58.272	6	10C
L E K M J D I G H F	58.196	6	17C
L E K M J D I G H F	57.862	6	8A
L E K M J I G H F	57.446	6	9B
L E K M J I G H F	57.310	6	7B
L E K M J I G H F	56.908	6	11C
L E K M J I G H F	56.647	6	15B
L K M J I G H F	56.167	6	6A
L K M J I G H F	55.497	6	11A
L K M J I G H F	55.159	5	17A
L K M J I G H	54.963	5	15C
L K M J I G H	54.871	5	16C
L K M J I G H	54.323	5	12B
L K M J I G H	54.196	5	16B
L K M J I G H	53.784	5	20A
L K M J I G H	53.415	5	14B
L K M J I G H	53.365	5	17B
L K M J I G H	53.259	5	20B
L K M J I G H	53.181	6	12A
L K M J I G H	52.038	6	6B
L K M J I G H	51.271	6	19A
L K M J I G H	50.671	6	12C
L K M J I G H	50.116	5	21B
L K M J I G H	49.891	5	22C
L K M J I G H	49.735	5	21A
L K M J I G H	49.043	6	15A
L K M J I G H	49.042	6	13B
L K M J I G H	47.312	5	16A
L K M J I G H	46.915	6	21C
L K M J I G H	46.449	6	13C
L K M J I G H	46.149	6	14C
L K M J I G H	45.996	5	22B
L K M J I G H	45.801	6	23B
L K M J I H	45.335	5	23C
L K M J I H	45.112	6	14A
L K M J I	43.403	5	18A

```
SNK        GROUPING                    MEAN      N   BXT
 L    K M J    I
 L    K M J    I                      42.423     6   18C
 L    K M J    I
 L    K M J    I                      42.321     6   22A
 L    K M J
 L    K M J                           41.991     6   23A
 L    K M J
 L    K M J                           41.900     6   20C
 L    K M
 L    K M                             41.546     6   18B
 L      M
 L      M                             37.657     6   24B
 L      M
 L      M                             36.699     6   24A
        M
        M                             34.708     6   24C
```

Table 32

Follow-up Pairwise Comparisons of the Block x Exemplar Interaction for VE (in Msec) for Experiment 2, Acquisition Phase (Variable BXT: Number=Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=239 MSE=285.573

WARNINGO CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=5.98338

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	19.2465	23.0423	25.2773	26.8556	28.0695	29.0528	29.8764	30.5848	31.2046	31.755	32.2494
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	32.6979	33.1079	33.4862	33.8353	34.1603	34.4642	34.7495	35.0184	35.2726	35.5136	35.7427
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	35.961	36.1693	36.3685	36.5592	36.7422	36.9177	37.0865	37.2489	37.4061	37.5567	37.7021
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	37.8426	37.9785	38.11	38.2376	38.3613	38.4816	38.5985	38.7124	38.8234	38.9317	39.0375
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	39.1409	39.2421	39.3412	39.4383	39.5335	39.627	39.7187	39.8089	39.8975	39.9846	40.0702
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	40.1544	40.2373	40.3188	40.399	40.478	40.5557	40.6321	40.7073	40.7813	40.8533	40.925
NUMBER OF MEANS	68	69	70	71	72						
CRITICAL RANGE	40.9955	41.0649	41.1331	41.2002	41.2661						

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING						MEAN	N	BXT
			A			133.737	6	1A
			A					
	B		A			127.829	6	1B
	B		A					
	B		A	C		114.841	6	3A
	B		A	C				
	B		A	C		114.234	6	1C
	B		A	C				
	B	D	A	C		109.389	6	4A
	B	D		C				
	B	D	E	C		101.732	6	4B
		D	E	C				
	F	D	E	C		95.897	6	5B
	F	D	E	C				
G	F	D	E	C		93.925	6	2B
G	F	D	E	C				
G	F	D	E	C		93.662	6	2A
G	F	D	E	C				
G	F	D	E	C	H	91.623	6	2C

SNK GROUPING	MEAN	N	BXT
G F D E C H	91.100	6	4C
G F D E C H	90.460	6	5A
G F D E I C H	84.528	6	3C
G F D E I J H	80.479	6	7C
G F D E I J H	80.373	6	9A
G F D K E I J H	78.226	6	3B
G F D K E I J H	76.962	6	7A
G F D K E I J H	76.604	6	19B
G F K E I J H	74.577	6	10B
G F K E I J H	73.932	6	8B
G F K E I J H	73.820	6	9C
G F K E I J H	73.682	6	5C
G F K E I J H	72.679	6	10A
G F K E I J H	72.412	6	8C
G F K E I J H	71.479	6	13A
G F K E I J H	70.721	6	8A
G F K E I J H	70.548	6	9B
G F K E I J H	70.168	6	11B
G F K E I J H	69.293	6	19C
G F K E I J H	69.015	6	6A
G F K E I J H	68.365	6	10C
G F K E I J H	68.316	6	7B
G F K E I J H	67.634	6	6C
G F K E I J H	67.588	5	11A
G F K E I J H	66.409	6	20B
G F K E I J H	66.086	6	19A
G F K E I J H	65.075	6	12A
G F K E I J H	64.911	6	6B
G F K E I J H	64.746	6	12B
G F K E I J H	64.339	6	16C
G F K E I J H	63.756	6	13B
G F K I J H	63.559	6	21B
G F K I J H	63.353	6	16B
G F K I J H	63.267	6	17C
G F K I J H	63.118	6	17B
G F K I J H	62.654	6	14B
G F K I J H	61.935	5	11C
G F K I J H	61.552	6	15B
G F K I J H	61.183	5	17A
G F K I J H	61.001	6	15A
G F K I J H	59.981	6	21A
G F K I J H	59.753	6	20A
G K I J H	56.555	5	13C
G K I J H	56.296	6	22C
G K I J H	55.208	6	23B
G K I J H	55.207	6	21C
G K I J H	54.870	6	15C
K I J H	53.797	6	14A
K I J H	53.269	6	20C
K I J H	52.765	6	12C
K I J H	52.253	6	16A
K I J	50.014	5	22B
K I J	49.668	5	22A
K I J	48.409	6	14C

```
SNK     GROUPING            MEAN      N   BXT
               K   I  J
               K   I  J    48.165    6   23C
               K   I  J
               K   I  J    47.219    6   18B
               K   I  J
               K   I  J    46.508    5   18A
               K   I  J
               K   I  J    44.983    6   18C
               K      J
               K      J    40.637    6   24A
               K      J
               K      J    40.421    6   23A
               K
               K           39.776    6   24C
               K
               K           39.705    6   24B
```

Table 33

Follow-up Pairwise Comparisons of Main Effect for Block on Relative Time Segment 1 (in Percent) for Experiment 2, Acquisition Phase

ALPHA=0.05 DF=115 MSE=65.5139

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	5.34426	6.40635	7.03389	7.47758	7.81958	8.09724	8.33013	8.53038

NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	8.70608	8.86183	9.00193	9.12911	9.24547	9.35255	9.45193	9.54437

NUMBER OF MEANS	18	19	20	21	22	23	24
CRITICAL RANGE	9.63083	9.71204	9.78879	9.86112	9.92974	9.99499	10.0572

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BLOCK
A	34.011	18	19
A	32.847	18	9
A	32.843	18	20
A	32.686	18	11
A	32.546	18	14
A	32.519	18	21
A	32.491	18	16
A	32.487	18	15
A	32.473	18	10
A	32.451	18	24
A	32.350	18	12
A	32.343	18	22
A	32.336	18	13
A	32.175	18	8
A	32.159	18	18
A	32.003	18	23
A	31.868	18	17
A	30.800	18	1
A	30.374	18	4
A	30.083	18	6
A	29.956	18	5
A	29.777	18	7
A	29.138	18	2
A	28.929	18	3

Table 34

Follow-up Pairwise Comparisons of Main Effect for Block on Relative Time Segment 2 (in Percent) for Experiment 2, Acquisition Phase

ALPHA=0.05 DF=115 MSE=36.4899

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	3.98847	4.78112	5.24947	5.58067	5.83583	6.04305	6.21686	6.36631
NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	6.49744	6.61368	6.71823	6.81315	6.89999	6.97998	7.05407	7.12306
NUMBER OF MEANS	18	19	20	21	22	23	24	
CRITICAL RANGE	7.18759	7.24819	7.30547	7.35945	7.41066	7.45936	7.50578	

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BLOCK
A	39.806	18	1
A	39.697	18	12
A	39.491	18	24
A	39.448	18	23
A	39.411	18	5
A	39.187	18	3
A	39.166	18	17
A	39.101	18	18
A	39.036	18	4
A	38.994	18	6
A	38.950	18	21
A	38.949	18	22
A	38.906	18	20
A	38.808	18	11
A	38.648	18	7
A	38.631	18	9
A	38.375	18	15
A	38.319	18	16
A	38.301	18	14
A	38.206	18	10
A	38.021	18	8
A	37.992	18	2
A	37.472	18	13
A	37.312	18	19

Table 35

Follow-up Pairwise Comparisons of Main Effect for Block on Relative Time Segment 3 (in Percent) for Experiment 2, Acquisition Phase

ALPHA=0.05 DF=115 MSE=46.8883

NUMBER OF MEANS	2	3	4	5	6	7	8	9
CRITICAL RANGE	4.52119	5.41971	5.9506	6.32604	6.61529	6.85018	7.04721	7.21662

NUMBER OF MEANS	10	11	12	13	14	15	16	17
CRITICAL RANGE	7.36526	7.49703	7.61554	7.72314	7.82158	7.91225	7.99624	8.07445

NUMBER OF MEANS	18	19	20	21	22	23	24
CRITICAL RANGE	8.14759	8.21629	8.28122	8.34241	8.40046	8.45567	8.50828

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	BLOCK
A	32.819	18	2
A	31.883	18	3
A	31.576	18	7
A	30.923	18	6
A	30.632	18	5
A	30.590	18	4
A	30.192	18	13
A	29.804	18	8
A	29.393	18	1
A	29.322	18	10
A	29.190	18	16
A	29.153	18	14
A	29.139	18	15
A	28.966	18	17
A	28.740	18	18
A	28.708	18	22
A	28.678	18	19
A	28.549	18	23
A	28.531	18	21
A	28.521	18	9
A	28.507	18	11
A	28.251	18	20
A	28.058	18	24
A	27.953	18	12

Table 36

Follow-up Pairwise Comparisons of Main Effect for Exemplar on Relative Time Segments 1, 2, and 3 for Experiment 2, Acquisition Phase (Task: A=Blue, B=White, C=Red)

Relative Time Segment 1

ALPHA=0.05 DF=240 MSE=6.65714

NUMBER OF MEANS	2	3
CRITICAL RANGE	0.59899	0.71712

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	TASK
A	31.9656	144	B
A	31.6803	144	A
A	31.5661	144	C

Relative Time Segment 2

ALPHA=0.05 DF=240 MSE=4.70365

NUMBER OF MEANS	2	3
CRITICAL RANGE	0.503493	0.60279

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	TASK
A	40.2607	144	C
B	38.2250	144	A
B	37.7927	144	B

Relative Time Segment 3

ALPHA=0.05 DF=240 MSE=5.53513

NUMBER OF MEANS	2	3
CRITICAL RANGE	0.546185	0.653901

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING	MEAN	N	TASK
A	30.2417	144	B
A	30.0947	144	A
B	28.1732	144	C

Table 37

Follow-up Pairwise Comparisons of the Block x Exemplar Interaction for Relative Time, Segment 1 (in Percent) for Experiment 2, Acquisition Phase (Variable BXT: Number= Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=240 MSE=6.65714

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	2.93444	3.51316	3.8539	4.09453	4.2796	4.42951	4.55506	4.66307	4.75757	4.84147	4.91685
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	4.98522	5.04773	5.10539	5.15862	5.20817	5.2545	5.298	5.33899	5.37774	5.41448	5.44941
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	5.48268	5.51444	5.54481	5.57389	5.60177	5.62854	5.65427	5.67902	5.70299	5.72595	5.74812
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	5.76953	5.79025	5.8103	5.82974	5.84861	5.86694	5.88477	5.90213	5.91905	5.93556	5.95169
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	5.96745	5.98288	5.99795	6.01279	6.02731	6.04156	6.05555	5.06929	6.08279	6.09607	6.10913
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	6.12197	6.1346	6.14703	6.15926	6.17129	6.18313	6.19479	5.20625	6.21753	6.2285	6.23944
NUMBER OF MEANS	68	69	70	71	72						
CRITICAL RANGE	6.25019	6.26076	6.27116	6.28139	6.29144						

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING		MEAN	N	BXT
	A	34.577	6	19A
	A			
B	A	33.953	6	19B
B	A			
B	A	33.578	6	9A
B	A			
B	A	33.519	6	13A
B	A			
B	A	33.502	6	19C
B	A			
B	A	33.450	6	8A
B	A			
B	A	33.231	6	15B
B	A			
B	A	33.081	6	14B
B	A			
B	A	33.075	6	20B
B	A			
B	A	32.963	6	11B
B	A			
B	A	32.927	6	20C
B	A			
B	A	32.919	6	18B

SNK	GROUPING		MEAN	N	BXT
	B	A	32.850	6	9B
	B	A	32.843	6	11A
	B	A	32.835	6	21B
	B	A	32.756	6	24C
	B	A	32.745	6	24B
	B	A	32.743	6	10B
	B	A	32.705	6	16A
	B	A	32.692	6	12B
	B	A	32.654	6	10A
	B	A	32.620	6	14A
	B	A	32.564	6	21A
	B	A	32.530	6	17B
	B	A	32.526	6	20A
	B	A	32.496	6	12A
	B	A	32.461	6	16B
	B	A	32.449	6	22B
	B	A	32.379	6	22A
	B	A	32.308	6	16C
	B	A	32.293	6	23C
	B	A	32.251	6	11C
	B	A	32.202	6	22C
	B	A	32.196	6	18C
	B	A	32.159	6	21C
	B	A	32.120	6	15C
	B	A	32.114	6	9C
	B	A	32.108	6	15A
	B	A	32.087	6	1A
	B	A	32.022	6	10C
	B	A	31.998	6	23B
	B	A	31.973	6	13B
	B	A	31.938	6	14C
	B	A	31.862	6	12C
	B	A	31.854	6	24A
	B	A	31.852	6	8B
	B	A	31.718	6	23A
	B	A	31.671	6	17C
	B	A	31.516	6	13C
	B	A	31.403	6	17A
	B	A	31.363	6	18A
	B	A	31.223	6	8C
	B	A	31.187	6	4B
	B	A	30.661	6	6C
	B	A	30.513	6	7C
	B	A	30.439	6	4C
	B	A	30.283	6	1B
	B	A	30.234	6	5C
	B	A	30.184	6	7B
	B	A	30.101	6	6B
	B	A	30.056	6	5B
	B	A	30.031	6	1C
	B	A	29.602	6	2C
	B	A	29.580	6	5A
	B	A	29.511	6	2B
	B	A	29.503	6	3B

SNK GROUPING		MEAN	N	BXT
B	A	29.496	6	4A
B	A	29.486	6	6A
B	A	29.047	6	3C
B	A	28.632	6	7A
B	A	28.452	6	2A
B		28.238	6	3A

Table 38

Follow-up Pairwise Comparisons of the Block x Exemplar Interaction for Relative Time, Segment 2 (in Percent) for Experiment 2, Acquisition Phase (Variable BXT: Number=Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=240 MSE=4.70365

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	2.4666	2.95305	3.23747	3.44174	3.5973	3.72331	3.82885	3.91963	3.99907	4.06959	4.13296
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	4.19043	4.24297	4.29144	4.33618	4.37783	4.41677	4.45334	4.48779	4.52036	4.55125	4.58061
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	4.60857	4.63527	4.6608	4.68524	4.70868	4.73118	4.75281	4.77361	4.79376	4.81306	4.83169
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	4.84969	4.86711	4.88396	4.90031	4.91617	4.93157	4.94656	4.96115	4.97538	4.98925	5.00281
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	5.01606	5.02903	5.04173	5.05417	5.06637	5.07835	5.09011	5.10165	5.11301	5.12417	5.13515
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	5.14594	5.15656	5.167	5.17728	5.1874	5.19735	5.20715	5.21679	5.22627	5.23549	5.24468
NUMBER OF MEANS	68	69	70	71	72						
CRITICAL RANGE	5.25372	5.26261	5.27135	5.27994	5.28839						

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING			MEAN	N	BXT
	A		42.334	6	1C
B	A		41.791	6	3C
B	A	C	41.287	6	2C
B	A	C	41.080	6	12C
B	A	C	40.960	6	5C
B	A	C	40.901	6	7C
B	A	C	40.828	6	4C
B	A	C	40.665	6	6C
B	A	C	40.550	6	11C
B	A	C	40.481	6	8C
B	A	C	40.261	6	24A
B	A	C	40.184	6	9C

SNK	GROUPING		MEAN	N	BXT
B	A	C	40.133	6	17C
B	A	C	40.112	6	24C
B	A	C	40.063	6	23A
B	A	C	40.050	6	18C
B	A	C	39.873	6	15C
B	A	C	39.868	6	18A
B	A	C	39.765	6	21C
B	A	C	39.634	6	20C
B	A	C	39.633	6	10C
B	A	C	39.558	6	14C
B	A	C	39.439	6	16C
B	A	C	39.408	6	17A
B	A	C	39.404	6	23C
B	A	C	39.386	6	22C
B	A	C	39.356	6	13C
B	A	C	39.219	6	22A
B	A	C	39.178	6	12B
B	A	C	39.030	6	1A
B	A	C	38.948	6	20A
B	A	C	38.878	6	23B
B	A	C	38.355	6	19C
B	A	C	38.334	6	12A
B	A	C	38.707	6	5B
B	A	C	38.662	6	14A
B	A	C	38.589	6	4A
B	A	C	38.577	6	21A
B	A	C	38.567	6	5A
B	A	C	38.507	6	21B
B	A	C	38.445	6	6A
B	A	C	38.243	6	22B
B	A	C	38.151	6	7B
B	A	C	38.137	6	20B
B	A	C	38.137	6	16B
B	A	C	38.100	6	24B
B	A	C	38.054	6	3A
B	A	C	38.054	6	1B
B	A	C	38.033	6	11A
B	A	C	37.958	6	17B
B	A	C	37.936	6	9A
B	A	C	37.872	6	6B
B	A	C	37.841	6	11B
B	A	C	37.806	6	15A
B	A	C	37.773	6	9B
B	A	C	37.717	6	3B
B	A	C	37.690	6	4B
B	A	C	37.590	6	10A
B	A	C	37.445	6	15B
B	A	C	37.393	6	10B
B	A	C	37.385	6	18B
B	A	C	37.380	6	16A
B		C	36.919	6	13B
B		C	36.891	6	7A
B		C	36.869	6	19B
B		C	36.863	6	8B

SNK GROUPING		MEAN	N	BXT
B	C	36.720	6	8A
B	C	36.683	6	14B
	C	36.524	6	2B
	C	36.211	6	19A
	C	36.166	6	2A
	C	36.143	6	13A

Table 39

Follow-up Pairwise Comparisons of the Block x Exemplar Interaction for Relative Time, Segment 3 (in Percent) for Experiment 2, Acquisition Phase (Variable BXT: Number=Block, Letter=Exemplar- A=Blue, B=White, C=Red)

ALPHA=0.05 DF=240 MSE=5.53513

NUMBER OF MEANS	2	3	4	5	6	7	8	9	10	11	12
CRITICAL RANGE	2.67575	3.20345	3.51415	3.73357	3.90233	4.03902	4.1535	4.25199	4.33815	4.41466	4.4834
NUMBER OF MEANS	13	14	15	16	17	18	19	20	21	22	23
CRITICAL RANGE	4.54574	4.60274	4.65532	4.70386	4.74904	4.79128	4.83094	4.86832	4.90365	4.93716	4.969
NUMBER OF MEANS	24	25	26	27	28	29	30	31	32	33	34
CRITICAL RANGE	4.99934	5.0283	5.056	5.08251	5.10794	5.13235	5.15581	5.17838	5.20023	5.22117	5.24138
NUMBER OF MEANS	35	36	37	38	39	40	41	42	43	44	45
CRITICAL RANGE	5.26091	5.2798	5.29809	5.31581	5.33302	5.34973	5.36599	5.38182	5.39725	5.4123	5.42701
NUMBER OF MEANS	46	47	48	49	50	51	52	53	54	55	56
CRITICAL RANGE	5.44138	5.45545	5.46922	5.48272	5.49596	5.50895	5.52171	5.53424	5.54656	5.55866	5.57056
NUMBER OF MEANS	57	58	59	60	61	62	63	64	65	66	67
CRITICAL RANGE	5.58227	5.59379	5.60512	5.61628	5.62725	5.63805	5.64867	5.65913	5.66942	5.67942	5.68939
NUMBER OF MEANS	68	69	70	71	72						
CRITICAL RANGE	5.69919	5.70884	5.71832	5.72764	5.7368						

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

SNK GROUPING						MEAN	N	BXT
			A			35.382	6	2A
	B		A			34.477	6	7A
	B		A	C		33.965	6	2B
	B	D	A	C		33.708	6	3A
E	B	D	A	C		32.780	6	3B
E	B	D	A	C	F	32.069	6	6A
E	B	D	A	C	F	32.027	6	6B
E	B	D	A	C	F	31.915	6	4A
E	B	D	A	C	F	31.853	6	5A
E	B	D	A	C	F	31.665	6	7B
E	B	D	A	C	F	31.663	6	1B
E	B	D	A	C	F	31.285	6	8B

SNK GROUPING						MEAN	N	BXT
E	B	D	A	C	F	31.238	6	5B
E	B	D	A	C	F	31.123	5	4B
E	B	D	A	C	F	31.109	6	13B
E	B	D		C	F	30.338	5	13A
E	B	D		C	F	30.235	6	14B
E	B	D		C	F	30.086	5	15A
E	B	D		C	F	29.915	5	16A
E	B	D		C	F	29.864	5	10B
E	B	D		C	F	29.830	6	8A
E	B	D		C	F	29.756	6	10A
E	B	D		C	F	29.696	5	18B
E	B	D		C	F	29.512	6	17B
E		D		C	F	29.402	5	16B
E		D		C	F	29.376	5	9B
E		D		C	F	29.323	6	15B
E		D		C	F	29.308	5	22B
E		D		C	F	29.212	6	19A
E		D		C	F	29.196	6	11B
E		D		C	F	29.189	5	17A
E		D		C	F	29.179	5	19B
E		D		C	F	29.162	5	3C
E		D		C	F	29.155	5	24B
E		D		C	F	29.129	5	13C
E		D		C	F	29.124	5	11A
E		D		C	F	29.124	6	23B
E		D		C	F	29.111	5	2C
E		D		C	F	28.382	5	1A
E		D		C	F	28.859	6	21A
E		D		C	F	28.806	6	5C
E		D		C	F	28.788	6	20B
E		D		C	F	28.769	6	18A
E		D		C	F	28.733	6	4C
E		D		C	F	28.718	5	14A
E		D		C	F	28.673	6	6C
E		D		C	F	28.670	6	12A
E		D		C	F	28.658	5	21B
E		D		C	F	28.586	6	7C
E		D		C	F	28.526	6	20A
E		D		C	F	28.504	6	14C
E		D		C	F	28.486	6	9A
E		D			F	28.412	6	22C
E		D			F	28.403	6	22A
E		D			F	28.345	6	10C
E		D			F	28.303	6	23C
E		D			F	28.296	6	8C
E		D			F	28.253	6	16C
E		D			F	28.219	6	23A
E		D			F	28.197	6	17C
E		D			F	28.130	6	12B
E					F	28.076	6	21C
E					F	28.007	6	15C
E					F	27.886	6	24A
E					F	27.754	6	18C
E					F	27.702	6	9C

SNK	GROUPING	MEAN	N	BXT
E	F	27.643	6	19C
E	F	27.635	6	1C
E	F	27.439	6	20C
E	F	27.199	6	11C
E	F	27.132	6	24C
	F	27.059	6	12C

Vita

Craig John Chamberlin was born on October 14, 1951 in Chemainus, British Columbia, Canada. After graduating from Elphinstone Secondary School, he attended Vancouver Community College before transferring to the University of British Columbia where he obtained his B.P.E. in 1975 and his M.P.E. in 1979. Following 2 years as an instructor at the University of Regina and 4 years as an instructor at Medicine Hat College, he enrolled at Louisiana State University where he obtained his Ph.D. in Physical Education (Motor Behaviour) in August, 1986.

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Major Field: Physical Education (Motor Behavior)

Title of Dissertation: The Memory Representation of Motor Skills: A Test of Schema Theory

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[illegible]

Date of Examination:

July 15, 1988